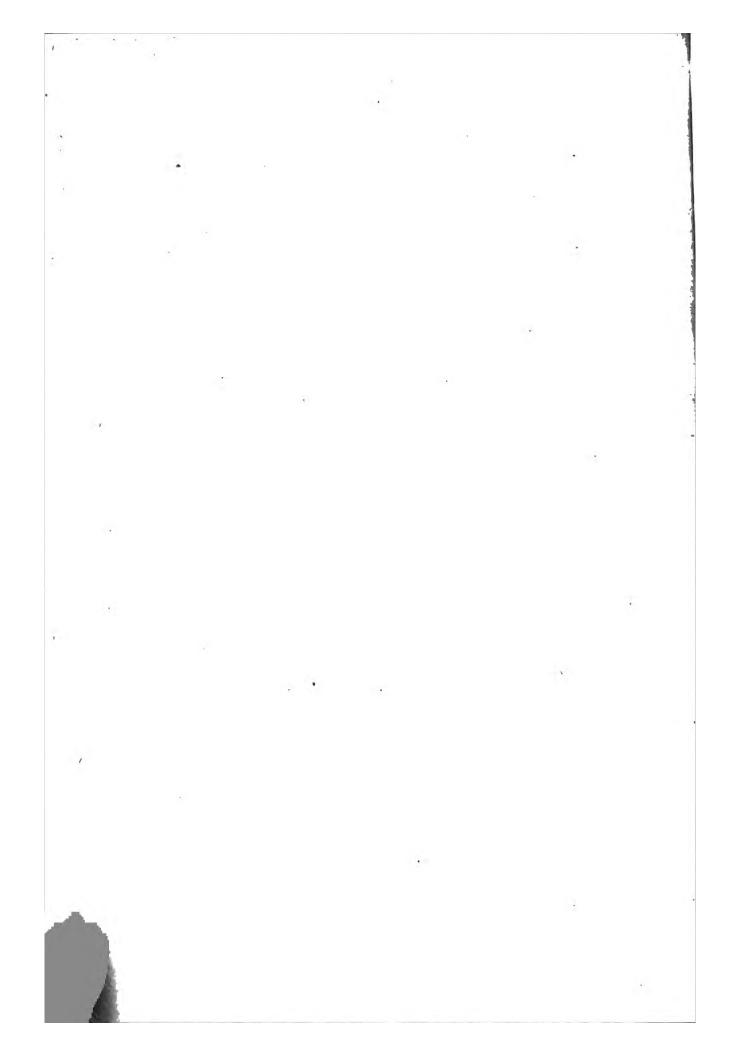


€	
	\$
•	



### SAJOUS'S

# ANALYTIC CYCLOPEDIA PRACTICAL MEDICINE

BY

CHARLES E. de M. SAJOUS, M.D., LL.D., Sc.D.

AND

LOUIS T. de M. SAJOUS, B.S., M.D.

WITH THE ACTIVE CO-OPERATION OF OVER

ONE HUNDRED ASSOCIATE EDITORS

SEVENTH
ENTIRELY REVISED AND GREATLY ENLARGED
EDITION

Illustrated with Full=page Balf=tone and Color Plates and Appropriate Cuts in the Text

VOLUME TWELVE

SUPPLEMENT



PHILADELPHIA

F. A. DAVIS COMPANY, PUBLISHERS

1926

COPYRIGHT, 1925
BY
F. A. DAVIS COMPANY.

Copyright, Great Britain. All Rights Reserved.

PRINTED IN U.S.A.
PRESS OF
F. A. DAVIS COMPANY
PHILADELPHIA, PA,

610.3 5322 1916 V.12

#### **FOREWORD**

Experience with earlier Supplements having demonstrated certain advantages of conformity of arrangement with that of the Cyclopedia proper, this arrangement has been preserved in the present volume, the separate disorders and therapeutic measures being dealt with in alphabetic sequence, with the large type adopted for the more important contributions on the symptomatology, etiology, diagnosis, etc., of the morbid conditions themselves, and the smaller type for matter of less fundamental significance, records of isolated cases, and therapeutic measures or diagnostic laboratory procedures.

A determined attempt has been made to present herein, in so far as space permitted, the practical contributions of recent years, up to the time of issue, that appeared worthy of addition to the fund of information already contained in the CYCLOPEDIA. The most important additions, probably, are those relative to scarlet fever, comprising the most recent contributions on the Dick test, active and passive immunization, and treatment by Dochez's serum and the antitoxin of Dick and In diphtheria, the recent interest in anatoxin (toxoid preparations) for immunization and in Zœller's test has been recognized in certain allusions in this volume. It has seemed advisable to include a review of the late extensive literature on anaphylaxis and allergy, with emphasis on their probable rôle as one of the major causes of disease, and the best means of recognition and treatment of their manifestations. The interesting but still obscure phenomenon of bacteriophagia has received attention. In the field of diagnosis, a number of newer procedures, such as cholecystography, the blood sedimentation test, the volume index of the erythrocytes in pernicious anemia, abdominoscopy and gastroscopy, fluoroscopy of the heart, as well as lymphocytosis in the early diagnosis of whooping-cough and leukopenia in that of smallpox, will be found included. Definite progress has also been made in the diagnosis of cerebral and spinal cord tumors. In the realm of drugs, details will be found concerning new agents or preparations such as afenil, allonal, hexyl resorcinol, metaphen, stovarsol, sulpharsphenamin, tryparsamide, etc. The newer data on the use of insulin, not only in diabetes and its complicating acidosis and coma, but also in a number of non-diabetic disorders, appear at various points in the volume. Recent developments in regard to the Röntgen ray and radium include, among others, the X-ray diagnosis of bronchiectasis, the implantation of radium seeds, and litholapaxy with fluoroscopy. In cancer, a gradually increasing attention is being paid to electrothermic methods.

In general treatment and prophylaxis, new procedures and suggestions, although not often of outstanding importance, have been very numerous in the aggregate, and many will doubtless assume permanent practical value. Among them are the intravenous dye injections in septic states, pneumonia in children, typhoid fever, phlebitis, etc.; further applications of non-specific protein therapy; theobromine in some forms of hydrocephalus; sodium thiosulphate in arsenical and mercurial poisoning; calcium injections in asthma, tuberculosis, adnexal inflammations, etc.; hexyl resorcinol in urinary tract infections; calcium lactate and parathyroid extract in sprue; chicken blood in pneumonia; convalescent serums in the prophylaxis of measles and other infectious diseases, and other measures too numerous to mention. The recent additions to surgical procedure or literature are referred to, and in the specialties, such as pediatrics, obstetrics, otorhinolaryngology, genitourinary disorders, etc., the most practical late observations have been included to the extent that space permitted.

In the new Index, bound separately, will be found listed all items contained in the 8-volume Cyclopedia, the two Index-Supplements (Volumes IX and X), the earlier Supplement (Volume XI), and the present Supplement (Volume XII).

THE EDITORS.

Риплания, December 1, 1925.

## SAJOUS'S ANALYTIC CYCLOPEDIA of PRACTICAL MEDICINE

#### SUPPLEMENT

#### A

#### ABDERHALDEN REAC-

TION. —A few contributions to the literature of this reaction have appeared since the preceding issue of the SUPPLEMENT, but the conclusions expressed concerning its possible clinical value differ little from those previously recorded. In 1921 Abderhalden described a simplified procedure in which the serum to be tested is poured into a test-tube containing the corresponding organ tissue, sterilized by boiling. In the case of placental tissue, for example, the fluid in the tube, incubated at 37° C., was stated to become turbid and later opaque if the serum was from a woman not too far advanced in pregnancy, while it remained unchanged if the serum was from a non-pregnant woman. Similar results are obtained, according to Abderhalden, from cases of cancer, dementia præcox, paresis, etc. The blood for the test is to be collected while the subject is in the fasting state.

According to E. Wollman et al. (Ann. de l'Inst. Pasteur, Feb., 1924), however, there is no evidence that Abderhalden's theory of "specific defensive ferments" is sound. Parenteral introduction of proteins in rabbits seldom increases the proteolytic properties of the serum and only in a nonspecific manner. F. Högler and P. Serio (Wien. Arch. f. inn. Med., Mar. 10, 1924) applied Pregl's refractometric modification of the Abderhalden reaction in 300 patients and found that while pathologic serums were generally more active catabolizers, their increased activity was usually di-

rected against several organs at the same time, showed marked variations against a given organ at different times, and could lead to no conclusion as to a specific character of the reaction. Similarly, F. C. Smith and V. J. Shipley (Am. Jour. of Obst. and Gyn., Jan., 1924) found tests on the serums of pregnant women uniformly positive, but also had numerous positive results with serums of men and non-pregnant women, concluding, therefore, that the test is not available for the diagnosis of pregnancy.

#### ABDOMEN, SURGERY OF.—

Progress in abdominal surgery in late years has been less concerned with changes in the actual operative technic than with the reduction of mortality by improved methods of handling the cases before, during and after the operative procedures. There is a continuing tendency to abandon the policy followed during what R. T. Morris (Amer. Jour. of Obst. and Gyn., Feb., 1924) has termed the third or pathologic era of surgery, in which eagerness to dispose of bacteria and their products led the surgeon to forget the patient and what the latter could do with his own internal resources. As this author expresses it, in the fourth or physiologic era the patient is being turned over to his own resources with the least degree of surgery necessary for recovery. Thus, in typhoid perforation of the bowel, or acute perforation of a gastric ulcer, instead of extensive wiping or washing followed by an ideal closing operation, a drainage device is quickly introduced under local anesthesia and the patient placed upon treatment which will conserve the natural resources. Similarly, wounds undergoing repair are seldom washed or wiped, and care is taken to avoid injury to new cells with germicides or irritating dressings.

According to G. W. Crile (Surg., Gyn. and Obst., Apr., 1924) who has developed an electro-chemical theory of cell life which he regards as affording a basis for the reduction of surgical mortality, the following conditions are desirable for the protection and restoration of the human organism, especially when subjected to operative procedures: (1) An abundant supply of water; (2) an abundant supply of oxygen delivered to the cells; (3) maintenance of the semi-permeability of the lipoid cell membranes; (4) an optimum temperature; (5) maintenance of integrity of the cells in the brain and liver; (6) sufficiently long and sufficiently frequent periods of sleep.

The practical application of these principles in "bad risk" cases is outlined thus: (1) Water in abundance by every route; 2 to 4 liters (quarts) by hypodermoclysis most quickly reaches the cells. (2) Oxidation promoted by maintenance of an adequate circulation; by transfusion if the blood volume is below normal, and by digitalization to strengthen the myocardium, if indicated. (3)

Semi-permeability of the cell membranes conserved by avoidance of ether and the use of nitrous oxide-oxygen analgesia plus local anesthesia. (4) Heat supplied according to individual indications, in particular large hot packs over exposed abdominal viscera; hot fluids by mouth, resulting in immediate increase of oxidation in the brain. (5) To promote integrity of the brain and liver: A minimum of trauma; operation in the patient's room; adequate rest and sleep; morphine, or other narcotics and sedatives.

Illustrating the effect of these precautions on surgical mortality, Crile reports a mortality of but 1.8 per cent. in 14,949 operations performed in 3½ years. In operations for acute abdominal conditions the mortality was 3.8 per cent., this group including 141 operations for cancer of the large intestine, with a mortality of 2.8 per cent. In 1000 thyroidectomies for hyperthyroidism the mortality was 0.8 per cent.

The improved status of diabetic cases as surgical risks as a result of the introduction of insulin as well as of better pre- and postoperative management and proper anesthesia has been emphasized by R. M. Wider and S. F. Adams (Wis. Med. Jour., May, 1924), who report a total surgical mortality in diabetics of 1.2 per cent. (3.6 per cent, in intraperitoneal operations), as against the former 12 to 30 per cent. In each of their 4 fatal cases, moreover, the fatal ending could be fairly attributed to the surgical complications themselves, there being no diabetic acidosis at the time of death. The preoperative medical treatment in diabetic cases, except in those requiring an emergency operation, consists of raising the carbohydrate intake to 100 Gm, for three days before operation, the dose of insulin being increased if required. On the morning of operation, a dose of 10 to 20 units of insulin is given. Subsequently, if food cannot be taken by the mouth, 50 to 60 Gm. (1% to 2 ounces) of glucose are given parenterally, with sufficient insulin. Blood tests are made daily, and in case of a low alkali reserve, 30 to 40 Gm. (1 to 1½ ounces) of sodium bicarbonate in a 5 per cent. solution are given by vein or enema. About 3 liters (quarts) of fluid are given each day, by mouth in so far as is possible.

From a study of the effects of surgical trauma in syphilitics, W. H. Goeckerman (Surg., Gyn. and Obst., Jan., 1925) concludes that the patient whose infection is of long standing is, on the whole, a poor surgical risk, but only in proportion to the damage his tissues have sustained; he is no worse a risk than another patient with an equal amount of damage from some other cause. Untreated syphilitic patients seldom develop postoperative difficulties (7 per cent.), but operation on a gumma increases the damage. Treated cases can be operated on with impunity, but the treatment should be sufficiently thorough; a dose or 2 of arsphenamin preparatory to operation is not necessarily a wise procedure, except as a protective measure for the surgeon. An attitude of suspicion of syphilis on the part of the clinician and a routine Wassermann test before operation (now a standing rule in the Mayo Clinic) are desirable for the reduction to a minimum of the operative risk from syphilis.

ANTEOPERATIVE MANAGE-MENT.—Purgation.—Recent experience has brought further support to the view that the time-honored preoperative purge should be omitted. R. O'Callaghan (Canad. Med. Assoc. Jour., Apr., 1924) refers to the well-known observation that emergency patients, in general, show a good postoperative recovery and an un-

eventful convalescence as an argument against the routine use of cathartics before operation. Purgation results in fatigue of the intestinal muscles, and in any case, without purgation, the small bowel is always empty twelve or more hours after a meal, while the colon can be cleared by enemas. In postoperative abdominal distention or distention in acute abdominal conditions, the writer likewise avoids purging, employing instead free gastric lavage with water or sodium bicarbonate solution, followed by morphine and atropine. He regards morphine in moderate amounts as a stimulant to motility in cases with a paretic intestine.

Preparation of Handicapped Patients.—Aside from the principles laid down by Crile and already described under an earlier heading, mention should be made of the efforts recently made at the Mayo Clinic to improve the prospects of surgical patients handicapped with such conditions as gastric retention, obesity, obstructive jaundice, urinary retention and exophthalmic goiter. As described by W. Walters (Ann. of Surg., June, 1924), patients suffering from the first of these conditions are kept under observation before operation until the washings from the stomach are free of food particles. Obese cases, by way of preparation, are placed on a diet low enough in calories to permit a loss of 10 to 15 per cent. of the body weight before operation. Jaundiced patients receive a daily intravenous injection of 5 c.c. (80 minims) of a 10 per cent. solution of calcium chloride for three days before operation, together with large quantities of fluids by the mouth, and glucose solution by proctoclysis. These measures have reduced the frequency of severe postoperative hemorrhage in cases with
intense obstructive jaundice. In patients with urinary obstruction due
to hypertrophied prostate, a water
pressure apparatus is used to overcome the condition gradually, the
bladder discharging slowly and being
emptied only in twelve to twentyfour hours. In exophthalmic goiter,
the giving of Lugol's solution is asserted to have, in the last two years,
reduced the postoperative mortality.

D. Fisher and M. W. Snell (Jour. Amer. Med. Assoc., Mar. 1, 1924) report cases illustrating the value of giving glucose and insulin before operation in non-diabetic acidosis. One case was that of man aged 46 years with severe abdominal pain, incessant vomiting, and acetone and diacetic acid in the urine. Glucose, 1000 c.c. of a 10 per cent, solution, was given intravenously in the course of an hour, and insulin, 30 units hypodermically, previous to operation. acetone and diacetic acid had disappeared eighteen hours later, no further vomiting occurred, and convalescence was uneventful.

Skin Sterilization.—Little that is new has appeared on this subject. G. de Tarnowsky (Jour. Amer. Med. Assoc., May 10, 1924), making a plea for simplicity of technic, states that preparation of the operative field should be restricted to shaving, washing with soap and water, and rubbing the skin with sponges soaked with ether or benzene, followed by the application of a dry sterile dressing.

In regard to the cleansing of the surgeon's hands, Theobald and Bigger (Lancet, Mar. 8, 1924) recommend that where there is a possibility of puncture of the gloves during an operation, the hands, before the

gloves are put on, should be rubbed together for half a minute in 1:1000 mercury biniodide solution, next in alcohol, and then allowed to dry. The rubber gloves themselves, according to the tests performed by these observers, can always be rendered sterile provided their surface is smooth, however badly contaminated, by washing with soap and water for one minute and then rinsing thoroughly in 1:1000 mercury biniodide solution.

Sterilization of Instruments.—That alcohol is an uncertain germicide for the disinfection of instruments has been emphasized by F. Brüning (Deut. med. Woch., May 30, 1924), who, upon witnessing 2 postoperative deaths from gas infection, found that the knife and scissors employed had been used a few days previously in a case of gunshot wound infected with B. aërogenes capsulatus and still bore this germ, though they had been cleaned with soap and water, dried and kept in 70 per cent. alcohol. To permit of the necessary boiling of scalpels without impairing the cutting edge, W. Wayne Babcock (Surg., Gyn. and Obst., Sept., 1923) recommends submergence of the scalpel blades, separated from the handles. in a protective, non-corrosive solution consisting of liquor cresolis comp., 5 parts, and pure glycerin, 95 parts. The blades are stuck by their butt ends in the cork of a vial filled with this solution, the cork firmly tied in, and the vial and contents boiled as long as required with the separate knife handles and other instruments. The solution is readily rinsed from the blades before use. After use, the blades are rinsed, dried, and replaced in the solution, their cutting edges being thus satisfactorily preserved.

Anesthesia.—Of the recent contributions on anesthesia, less have been concerned with the administration of the classic inhalation anesthetics, ether and chloroform, than with a discussion of the merits of the new general anesthetic, ethylene, and of the relative values of various forms of regional and local anesthesia. A comprehensive review of recent anesthetic practice at the Mayo Clinic has, however, been published by W. R. Meeker and M. Hines (Brit. Jour. of Anesth., July, 1924). Ether by the semiopen drop method has been retained as the standard anesthetic for prolonged anesthesia with relaxation and unconsciousness. Nitrous oxideoxygen is used in brief anesthesias, operations not involving the abdominal cavity, cases in which shock is apprehended, and those with severe sepsis. Ethylene-oxygen is featured by a certain amount of muscular rigidity; in abdominal surgery, addition of ether is required for proper relaxation. Local anesthesia is regarded at the Mayo Clinic as not entirely avoiding the dangers of inhalation narcosis. It is used oftenest in the repair of hernia, operations on the pelvic floor and viscera, and about the neck and cranium, and is least successful in the more extensive abdominal operations; it is not facilitated by paravertebral or splanchnic nerve-block. Spinal anesthesia is employed mainly in extensive operations on the lower limbs when there are contraindications to inhalation anesthesia.

The promotion of relaxation under anesthesia by *posture* has been emphasized by C. B. Palmer (Cal. State

Jour. of Med., Jan., 1924) as a point frequently overlooked. Tension on the abdomen is eased, and the patient's comfort promoted, by flexing the thighs to a varying extent, and if further relaxation is needed, by elevating the chest on a pillow. The same results are obtained in the Trendelenburg posture, which is one of considerable strain, by raising the legs and supporting them. Attention to proper posture, aside from greater relaxation, is asserted by the writer to further the ease and rapidity of induction and render a less profound degree of anesthesia sufficient.

The effect of stretching of the muscles, rather than of manipulation of the peritoneum, in initiating the reflex rigidity frequently encountered during abdominal operations is brought out by A. E. Guedel and K. R. Ruddell (Amer. Jour. of Surg., Apr., 1924). Light nitrous oxide-oxygen anesthesia is insufficient to control this reflex, which is best corrected by a complete circumferential infiltration of the abdominal muscles with 0.5 or 0.25 procaine solution around the site of the intended incision. The inner edge of the circle of infiltration is 1 inch or more from the incision, and the circle about 1 inch wide.

In regard to ethylene, J. S. Horsley, Jr. (Va. Med. Mthly., Mar. 1924), reporting on 116 cases, comments on the ease and rapidity with which anesthesia was induced by ethyleneoxygen, but notes that relaxation was not as complete as with ether, though more complete than with nitrous oxide. In upper abdominal operations, relaxation was sufficient in but 34 per cent.; in the remainder, ether had to be used part of the time. Nausea and vomiting were less than after other anesthetics. Postoperative accumulation of gas was discomforting in but 20 per cent. of the The average percentage of ethylene required to maintain surgical anesthesia was 82. The drug is regarded as much safer than nitrous oxide.

Though much has been written concerning the use of local anesthesia in abdominal surgery, the tendency on the part of most surgeons has been to restrict the procedure to cases in which general anesthesia is contraindicated. R. E. Farr (Surg., Gyn. and Obst., Sept., 1924), who for more than ten years has been using local anesthesia in over 90 per cent. of gallbladder cases and 97 per cent. of appendix cases, feels that the method is not being used in abdominal surgery as extensively as its merits warrant. Successful completion of an operation under local anesthesia depends on 2 factors—surgical strategy and anterior splanchnic or sympathetic anesthesia. The former is directed toward obtaining adequate exposure without production of pain or the dreaded "positive pressure" or expulsive effort. The operative field is placed at the highest possible level by tilting the operating table, and all movable viscera are allowed to fall to lower levels. As the sympathetic nerves usually accompany vessels, the large arteries supplying the stomach, colon, small intestine, spleen or uterus form useful guides in establishing sympathetic anesthesia. The greater, lesser or pelvic sympathetics are reached through their ganglia or immediate branches. The anesthetic solution is introduced retroperitoneally under direct vision. Retraction should be mild, elastic, symmetrical and continuous, in order to avoid exciting an expulsive effort on the part of the patient. In cholecystectomy, for example, the pylorus is retracted to the left, the duodenum downward, and the colon and omentum in Morris's pouch to the right. The lower hepatic margin is then retracted upward, exposing the hepaticoduodenal pouch. By introducing the needle through the peritoneum this area may be completely anesthetized.

Abdomen.

W. Wayne Babcock (Surg., Gyn. and Obst., Sept., 1923) agrees that splanchnic anesthesia, induced by deep paravertebral injections or, more easily, by retroperitoneal injections after opening the abdomen, widens the field of local anesthesia for visceral surgery, permitting of completion of the most serious operations, such as partial gastrectomy, nephrectomy and splenectomy, in patients hitherto considered too weak to withstand the operation. To facilitate intraabdominal manipulation in operations under local anesthesia, a heavy infiltration of the preperitoneal space about the wound is most valuable. As soon as the abdomen is opened, the finger or hand is gently introduced as a guide, the needle repeatedly carried down to, but not through, the peritoneum and 200 to 600 c.c. (6½ to 20 ounces) of solution injected (0.25 per cent. procaine with 1:60,000 to 1:100,000 of adrenalin in Ringer's or saline solution). By diffusion this gives a desirable degree of splanchnic anesthesia. In such acute infections as pneumonia, nephritis or peritonitis with a sthenic patient, when the shortest operation with complete muscular relaxation and the least manipulative exposure or protoplasmic disturbance is desirable, spinal anesthesia is preëminent. Sacral, candal and paravertebral anesthesia, while slower, somewhat less certain and at times more difficult to induce

than spinal anesthesia, avoid the danger of the thecal puncture, usually produce little effect on the bloodpressure, and give a very enduring and valuable analgesia for operations on the pelvic organs, especially for carcinoma of the rectum.

[See also the separate heading, AN-ESTHESIA.]

Incision.—In a review of the abdominal incisions recently in favor, A. H. Southam (Brit. Med. Jour., Mar. 22, 1924) refers, in regard to the operations on the biliary tract, to the vertical muscle-splitting incision through the outer third of the rectus muscle. This incision, while affording excellent access and satisfactory drainage, disregards the nerve trunks. other incision now popular is the paramedian, rectus-sheath incision, with retraction of the muscle outward. In cases of perforated gastric or duodenal ulcer, acute cholecystitis, or other conditions calling for urgent operations on the upper abdomen, the best procedure is a muscle-splitting incision through the inner third of the rectus muscle; this avoids injury of the nerves situated farther out on the rectus. For the appendix, Battle's incision gives better access than McBurney's, generally obviates nerve injury, and is less destructive. In pelvic operations, incisions through the midline are still widely employed, having advantages in the absence of vessels and nerves in this region and the avoidance of injury to the rectus

In the surgery of the kidney, J. E. Summers (Neb. State Med. Jour., Aug., 1923) advocates a *transverse* incision beginning a little below and behind the palpable end of the 11th rib and extending not quite to the

midline between the umbilicus and ensiform. The muscles are divided in separate planes, great care being taken to avoid the nerves. The incision is extraperitoneal and leads directly to the body of the kidney. The free end of the 11th rib generally points to the pedicle, which is exposed on its anterior aspect and can be secured previous to removal of the organ. The upper pole of the kidney is asserted to be under better control than with other incisions, and tumors are more easily liberated. Conversion of the incision into a laparotomy on either side is feasible.

> A hockey-stick incision for inguinal herniorrhaphy is advocated by F. W. Rankin (Surg., Gyn. and Obst., July, 1924), who states that in the customary incision slightly above and parallel to Poupart's ligament, it is sometimes difficult or even impossible to avoid contamination of the operative field, the lower third of the incision being through the dense hair follicles of the pubic region and the dressing often getting loose. The writer's incision starts in the midline 3 inches above Poupart's ligament, courses transversally outward to the inguinal fold, and then, bending at an obtuse angle, passes in the fold of the groin toward the anterior superior iliac spine for 2 or 3 inches, or more if desired. A gentle curve, rather than a sharp angulation, insures quick healing. The lower flap is next undermined downward toward the symphysis and the spermatic cord exposed. The upper flap needs little undermining. The transverse arm of this incision is slightly above the pubic hair line in women and through a thinning hair margin in men. It proved satisfactory in a large series of cases.

Sutures.—A method of using fat to support sutures in the closure of accidental or operative wounds of parenchymatous organs such as the kid-

ney, liver and spleen, in order to prevent cutting of the sutures through the tissues, has been described by E. Beer (Surg., Gyn. and Obst., Nov., 1923). He uses it regularly in dealing both with decapsulated and undecapsulated kidneys. Fairly heavy chromic gut is threaded through a needle and the 2 ends knotted together. The stitch is passed deeply through the tissues to be sutured, and before pulling up the knot against the tissues a piece of fat from the adjacent wound is slipped through the loop under the knot and the suture then drawn tight. On the other side, where the needle has emerged, another piece of fat is placed over the tissues and the 2 ends of gut tied over it after removal of the needle. The knot is pulled up as tight as required to control bleeding, and as no tissue is throttled by it, as is the case with mattress sutures, very little parenchyma is destroyed as a result of the procedure.

Drainage.-Most of the recent contributions relating to drainage follow the trend which has been manifest since the war, viz., that of usually dispensing with drainage in abdominal operations, even in peritoneal infection. R. St. L. Brockman (Brit. Jour. of Surg., Apr., 1924), referring to acute appendicitis, states that if a patient possesses strong resistance to infection, it is immaterial whether drainage is established or not. If he lacks this power, trouble is to be expected in either event. Fecal fistulæ, secondary hemorrhage, residual abscesses and intestinal bands are much more common, and convalescence more prolonged, where drainage is used. The writer classifies cases of appendicitis into: (1) Those with a

frankly localized abscess with granulating walls, which bleed freely as soon as the pus is evacuated; in such cases drainage is indicated. (2) Those of ordinary acute appendicitis without gangrene or perforation; 390 such cases were treated by appendectomy and primary closure without untoward results; drainage is required only when the appendix is buried in a mass of old adhesions removal of which causes oozing. (3) Those of gangrenous or perforative appendicitis with diffuse peritonitis, often purulent; the advisability of drainage depends on the state of the peritoneum, drainage being necessary, as a rule, only in the few cases in which the cells of the peritoneum have obviously undergone a destructive change, in which event closure without drainage would change the potential abscess into an actual abscess. Illness exceeding three days, children under thirteen years with gangrenous appendix and purulent fluid in the pelvis, and cyanosis without dyspnea are conditions favoring drainage.

In a similar vein, Sir Henry M. W. Gray (Surg., Gyn. and Obst., Aug., 1924) states that in operating for acute appendicitis with spreading peritonitis, after sucking or soaking out fluid or foul pus, he closes the peritoneum completely, merely placing a rubber dam drain at each end of the wound, reaching to the preperitoneal tissue, in case the newly cut tissues have been infected. In several hundred cases of acute appendicitis dealt with by the writer and his assistant since the war, they have felt compelled to drain in only about 1 in 14 cases. The mortality in the drained cases was 9 per cent., and in the undrained, 5 per cent. The 2 conditions



8

indicating drainage are: (1) Persistent oozing of blood from an abscess cavity and a condition of the patient necessitating rapid operation; (2) a shaggy, irregular lining covering the surface of the abscess.

In contrast to the observers just mentioned, R. L. Payne (Surg., Gyn. and Obst., Sept., 1924) sounds a note of warning against disregard of drainage and too literal acceptance of the dictum, "when in doubt do not drain." This dictum, he avers, has already in many cases resulted in serious complication or death when applied by inexperienced operators. The experiments of Yates have shown that adhesions by fibrin completely isolate a drained point from the rest of the peritoneal cavity in from a few to 24 hours, but during this period a drain to the local source of infection will provide a pathway of least resistance for a certain amount of toxin that could possibly prove lethal if retained. The writer accordingly favors the principle, "when in doubt, always drain for 24 hours," when normal peritoneum has been soiled. In appendix cases with peritonitis, local or diffuse, he uses a cigarette drain, lifted about 1 inch at the end of 24 hours and removed when the secretions stop or merely stain the dressing. In 209 cases with localized peritonitis thus drained locally at the source of infection the mortality was 2.3 per cent. and in 54 cases of diffuse suppurative peritonitis, 29.6 per cent., the mortality in the whole series being 6 per cent.

To determine whether drainage is indicated or not, A. O. Wilensky and B. N. Berg (Ann. of Surg., May, 1923) use as a practical criterion the making of smears directly from the

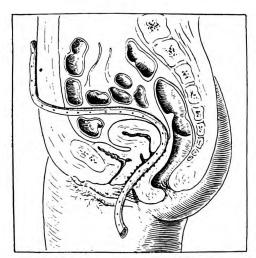
surfaces of the involved viscus and from peritoneal exudate present. The smears are stained by Gram's method. When they show absence of bacteria, or but 1 organism in 5 or more high power microscopic fields, drainage may be safely omitted, according to the writers' observations.

H. Hantcher (Presse méd., Jan. 9, 1924) points out the importance of providing for the varying specific gravity. viscosity and composition of the fluids to be drained if successful drainage by capillarity is to be obtained. The drains should, furthermore, remain open even when the fluids contain more or less solid material. To answer these requirements, he has devised drains made of a number of rubber strips crossing each other at acute angles, the cross-section of each drain having the appearance of a cogwheel, with or without a central longitudinal hole. Drainage of various kinds of fluids takes place in the angles, and is more active than with the ordinary tubes, the fluids being removed as fast as formed. There are no lateral holes to become plugged. Fluids may be injected to the bottom of the wound through the central channel in the drain.

In cases of large, deeply situated appendiceal abscesses in which the ordinary transabdominal drainage is unsafe, entailing risk of extensive peritoneal contamination, J. R. Eastman (Jour. Am. Med. Assoc., Mar. 24, 1923) advises the use of a very large cigarette drain with a protruding tuft of gauze, to be placed upon the abscess, the wound being then closed around the distal end of the tube. Almost invariably rupture of the abscess, with drainage along the tube, takes place within forty-eight hours. In the meantime the canal formed about the tube has been sealed off by peritoneal adhesions.

As observed by C. L. Larkin (Surg., Gyn. and Obst., Feb., 1925),

there are times when, after an abdominal incision, the pelvic condition is found to be such that thorough drainage is necessary. As a rule, a drain inserted in a posterior colpotomy wound in such cases soon falls out, while a drain in the abdominal wound yields little drainage, if any. The writer employs a through-and-through drain [see illustration] made of dental rubber sheet 0.01 inch thick, rolled into a cylinder, with its free edge caught at inter-



Larkin's through-and-through drain (Surg., Gynec, and Obst.).

vals by interrupted silk sutures. Holes 1/2 inch apart are punched through it with an ordinary ticket punch. A rubber sheet 1 foot square, rolled loosely to a diameter of 1/2 inch, makes a drain with 20 adjacent surfaces. The drain is well soaked in sterile fluid before use, and when once wet must be kept moist. Above and below the drain projects 3 or 4 inches from the body into layers of gauze. Drainage by this method is so free that the pelvis can be irrigated without fear of spreading infection. The drain is easily removed by gentle traction on the vaginal end.

POST-OPERATIVE COMPLI-CATIONS.—Shock or Syncope.—E. I. McKesson (Brit. Jour. of Anesth., Apr., 1924) classifies circulatory depression into 3 degrees, the third comprising a pulse-rate of 100, progressively increasing, with systolic pressure of 80 mm. Hg or less, diastolic of 60 mm. or less, and pulse pressure of 20 mm. or less, all progressively falling. This condition is fatal in 69 per cent. of cases if allowed to continue for over 20 or 30 minutes. Prompt administration of saline solution intravenously in sufficient amount to raise the systolic pressure to within 10 per cent. of the patient's normal will save most cases. The solution should be at body temperature and given rapidly enoughup to 100 c.c. per minute-to build up the systolic pressure progressively. R. C. Coburn (Jour. Amer. Med. Assoc., May 31, 1924) regards blood transfusion as the preëminent measure for prophylactic and restorative treatment of surgical shock and hemorrhage. Where it cannot be applied soon enough, he advocates intravenous injection of 250 c.c. (8 ounces) of a 6 per cent. solution of gum acacia with 20 per cent. glucose at the rate of 4 c.c. per minute. The solution should have been previously prepared, and must be sterile and clear. The patient should be watched for a recurrent depression when the effect wears off.

To overcome the effects of anesthesia, shock or hemorrhage, G. Panis (Rev. de chir., No. 4, 1924) advocates oxygen inhalation through a mask of the type of that of Legendre and Nicloux. The amount to be given is

about 600 liters in an hour's time; more may be given later if the symptoms of depression return.

> W. Wayne Babcock (Amer. Jour. of Obst. and Gyn., Aug., 1923) outlines a plan for resuscitation in abdominal surgery essentially as follows: (1) Patient placed on her back with the arms extended and supported at the sides of the head. (2) Anesthetist pries the jaws apart, pulls the tongue forward, if necessary, and observes the respiration. (3) Assistant No. 1 at once gives an intravenous injection, beginning with 200 c.c. of warm saline or Ringer's solution with 10 minims (0.6 c.c.) of 1:1000 adrenalin solution added. The tubing is compressed at the first return of pulsation; 1/2 minim of adrenalin is often ample. More solution is injected, if required, until a response is obtained. (4) Assistant No. 2 practises rhythmic compression of the chest; if this fails to move the tidal air, he places gauze over the mouth, compresses the nostrils, and practises mouth-to-mouth insufflation. (5) The operator, with one hand under the left diaphragm, compresses the heart 20 to 30 times a minute, observing the neck vessels for pulsations. The heart massage brings the adrenalin to the coronary vessels. If effective cardiac massage is impossible, injection of 500 c.c. (1 pint) of fluid with 4 c.c. (1 dram) of adrenalin solution, transthoracic massage, or intracardiac injection may be used. In transthoracic massage, the index finger follows the knife through a stab 1 inch long in the 3d left interspace, 1 inch from the sternum; it partially circles the left ventricle and rhythmically compresses the heart against the chest wall.

> To prevent a pneumothorax, wet gauze is wrapped around the base of the finger and held over the opening when the finger is withdrawn. These measures failing, an intracardiac injection of 3 to 60 minims (0.2 to 4 c.c.) of adrenalin may be made with a fine long needle into the cavity of the left ventricle.

Retention of Urine.—To avoid the discomfort and possible risks of catheterization for this condition, S. van Stapelmohr (Münch. med. Woch., Mar. 21, 1924) injects 5 c.c. (80 minims) of a 40 per cent. solution of hexamethylenamin intravenously ten to twenty hours after the operation in patients unable to urinate spontaneously. Of 45 cases thus dealt with, only 1 required catheterization. Giving the drug by the mouth proved ineffective.

Vomiting and Distention.—R. Matas (Jour. Amer. Med. Assoc., Aug. 9, 1924) lays stress on the value of gastroduodenal drainage and irrigation by permanent nasopharyngeal intubation in pre- or post-operative vomiting induced by mechanical obstruction, intestinal paresis or other causes, W. L. and C. P. Brown (Ibid.), for duodenal tube drainage, have been using the Jutte tube with a small metallic tip or sinker. They find passage of the tube through the nose much more satisfactory than through the mouth, nearly all patients swallowing it without difficulty-after nasal insertion-if allowed to drink water. A glass syringe with rubber bulb is best for emptying the stomach and lavage. The tube may, if desired, be left in from a few hours to several days. It not only relieves conditions due to gas and regurgitated stomach contents, but effects interrupted or continuous lavage of the stomach and, in some cases, of the duodenum, relieves nausea, permits of the free drinking of water and transgastric feeding, relieves toxemia, affords a port of entry for medication, and causes a subjective feeling of improvement. In acute intestinal obstruction the writers use the tube for

lavage before operation and leave it in during and after the operation. Postoperatively, the tube should be used: (1) In all cases of prolonged vomiting, distention and thirst; (2) in peritonitis, postoperative intestinal obstruction, resections, gunshot wounds and gallbladder operations. It is invaluable for relieving gas pressure on suture lines. With it may be advantageously combined subcutaneous administration of large quantities of 3 per cent. salt solution (Orr and Haden) and massive hot moist compresses kept hot with an electric pad (Ochsner).

According to J. T. Case (Trans. West. Med. Assoc., Dec., 1922) X-ray examination is of service in the diagnosis of suspected postoperative ileus. It can be completed in five minutes, requires no opaque medium, and the dressings are not removed. The negative, developed at once, shows whether the gaseous distention, if any, is in the stomach or the small or large intestine.

In severe postoperative atony in which either physostigmine or pituitary extract, given alone, failed, D. G. T. K. Cross (Brit. Med. Jour., Jan. 5, 1924) found a combination of these drugs uniformly effective unless an unsuspected mechanical obstruction was present. The usual dosage was 0.5 c.c. (8 minims) of pituitrin and \( \frac{1}{1}\) foo grain (0.0006 Gm.) of physostigmine.

In the vomiting of postoperative non-diabetic acidosis, W. Thalhimer (Wis. Med. Jour., May, 1924) relieved the condition in a number of cases by giving 1000 c.c. (1 quart) of a 10 per cent. solution of glucose intravenously together with insulin in the form of 40 units of H-iletin or 30 units of V-iletin hypodermically in divided doses. The glucose was administered slowly in 3 to 5 hours.

Adhesions.—In 236 gynecologic cases in which a second laparotomy was

performed, E. Haug and K. Heudorfer (Münch. med. Woch., Apr. 13, 1923) found only 15.7 per cent. of cases in which the first laparotomy had been performed in the same clinic free of adhesions, and only 10.7 per cent. where it had been performed elsewhere. The reproductive organs showed adhesions in the greatest proportion of cases (60.4 per cent.) and the sigmoid in the least (17.4 per cent.). Disturbances due to adhesions developed in 9.6 per cent. of the cases. According to Payr, adhesions require reoperation in 3.5 per cent. of cases. In the diagnosis pneumoperitoneum is a great aid. Humanol or sodium chloride solution do not prevent adhesions, but enemas, cathartics and hypophysin may possibly be of service. Heat externally and diathermy act favorably, and at times the pneumoperitoneum used for diagnosis proves curative.

J. B. Deaver (Surg., Gyn. and Obst., Oct., 1923) deems inciting peristalsis to liberate or prevent adhesions neither logical nor effective. He warns against pre-operative and, more particularly, post-operative purgation as irritating the intestinal wall, making it more easily penetrable by bacteria, and disturbing the protective layer of fibrin over the intestines, thus creating a chance for adhesions to develop. Having the patient get out of bed as soon as is consistent with the pathologic and other conditions is a wise prophylactic measure. After discharge from the hospital, suitable exercises, such as gymnastics and swimming, are useful to break up slight adhesions and perhaps to prevent the formation of others. Reoperation in acute postoperative intestinal obstruction due

to adhesions usually gives satisfactory results.

To prevent adhesions, according to I. S. Haines (Amer. Jour. of Surg., Mar., 1924), incisions should be long enough for thorough exposure, thus avoiding excessive handling and traction. The viscera should as much as possible be left in the abdomen; in packing them off, a sponge wrung out of hot saline solution should be so placed as not to drag on the wound. All raw surfaces should be covered with peritoneum. In a pelvis from which adherent tubes, tumors, etc., have been removed, with widespread oozing, adhesions can be prevented by suturing the margin of the sigmoid, without kinking or angularity, about the pelvic inlet to exclude the lower part of the abdominal cavity. Veils crossing the hepatic flexure or bands crossing the ascending colon and attached to the beginning of the transverse colon should be severed, but other types of colonic veils, unless causing trouble, should be left alone, as they are ultimately absorbed.

Bronchopulmonary Complications.— The results of further study of these complications have supported the view that they bear little relation to the kind of anesthetic used, and that the condition developing is less frequently an actual pneumonia than was formerly supposed.

Aside from pulmonary embolism and infarction, much has been written of late on massive collapse of the lung, and W. E. Lee (Ann. of Surg., Apr., 1924) goes so far as to suggest that the conditions just mentioned are the real etiologic factors in lung complications, all other factors, such as anesthesia, exposure, infection, old age, etc., being merely contributory.

In massive pulmonary collapse, an entire lobe is generally involved, and sometimes the whole lung. Symptoms may be severe, moderate or ab-

sent. The condition occurs most commonly after abdominal operations, especially those for hernia and appendicitis. According to F. J. Hirschboeck (Minn. Med., June, 1924), the reason for this is that abdominal operations lead at once to an immobility of the diaphragm and deficient lung aëration. The condition is attended with characteristic diagnostic signs, viz., reduction or absence of chest excursion over the involved area and displacement of the cardiac impulse to the affected side; on the left side the apex may even be felt in the axilla, and on the right, at the tip of the sternum or to the right of it. The X-ray confirms this displacement, and also shows a rise in the dome of the diaphragm and pulmonary collapse. Cough is slight at first, but later there is copious mucopurulent expectoration. In bilateral cases dyspnea may be extreme. Differentiation from pneumonia or infarct is assisted by the absence of bloody sputum.

C. C. Lund and M. Ritvo (Boston Med. and Surg. Jour., June 26, 1924) refer to the combination of dulness or flatness at the base of one lung with heart displacement as diagnostic. The temperature, pulse and respiration rise at the start. The condition appears a few hours or days after operation or injury, usually with pain or tightness in the chest, cyanosis and dyspnea. The writers believe it due to mucus plugs in the bronchi, with recumbency and protective muscular spasm as predisposing factors. The prognosis is generally good, and the duration one to ten days, with recovery usually gradual but sometimes abrupt. The treatment is symptomatic. Prophylaxis consists in endeavoring to prevent mucus formation in the bronchi and to promote expansion of the bases of the lungs during and after operation.

> According to S. H. Geist and M. A. Goldberger (Ann. of Surg., Dec., 1923), postoperative hypostatic pneumonia, pulmonary edema, etc., as well as postoperative shock, are circulatory conditions which can be favorably influenced in a preventive sense by preoperative digitalization to maintain the blood and pulse pressure levels. The total amount of drug given in their cases was one 11/2-grain (0.1 Gm.) tablet of digitan per 15 pounds of body weight. The drug is first given 24 hours before operation, then every 2 hours until the whole amount has been taken. On the morning of the operation 2 more doses are given at 2-hour intervals. Sometimes another dose is given 12 or 24 hours after operation. Whereas in non-digitalized cases various observers have recorded 8 to 27 per cent. of lung complications, in the 100 digitalized cases the incidence was but 3 per cent. W. J. Klug (Deut. Zeit. f. Chir., clxxvii, 236, 1923), giving 3 c.c. (48 minims) of digipuratum intramuscularly after operations, did not find it a prophylactic against lung complications, but he observed marked benefit from it when such complications had developed.

J. C. Hubbard (Boston Med. and Surg. Jour., Mar. 27, 1924) witnessed 3.8 per cent. of pulmonary complications in 206 cases operated for single inguinal hernia and 20 per cent. in 58 cases with double inguinal hernia. The average age in the 2 series was the same—44 years. In view of this observation he deems it best to avoid operating at the same time on the 2 sides in double hernia.

For the prevention of postoperative lung complications, R. Eden (Münch. med. Woch., June 13, 1924) advocates the intravenous use of calcium in the form of afenil. Whenever there is apprehension of a postoperative pneu-

monia, he injects the drug on the day of the operation or the preceding evening, and again on the following day. The treatment proved of service even when pulmonary edema had already set in. Post-anesthetic vomiting seemed to be greatly reduced or prevented by it. For therapeutic purposes, the author adds to the calcium intramuscular injections of quinine with urethane [ethyl carbamate], with asserted prompt success in the pneumonia cases.

Hernia.—In the 5 years ending with 1919 the 596 patients operated on for incisional hernias at the Mayo Clinic constituted, according to J. C. Masson (Surg., Gyn. and Obst., July, 1923), 14.66 per cent. of the total number of operations for hernia. In a series of 512 of these cases, 33.78 per cent. occurred after low middle line incisions-the usual locality, in the writer's experience, in which postoperative hernias occur without preceding infection. To guard against future trouble in this kind of incision he advises opening the rectus sheath on either side and making a closure exactly as in the ordinary straight incision.

General precautions against postoperative hernia are: (1) Accurate approximation, or better, overlapping or duplication of the peritoneum. (2) Thorough control of hemorrhage. (3) Approximation of muscle tissue without undue tension. (4) Overlapping of fascia wherever possible. (5) Absorbable material for all buried sutures. (6) Tension suture when plain catgut is used.

Massive hernias to be operated, especially in the obese, require preoperative rest in bed and diet to reduce weight (20 to 30 pounds in 3 to 6 weeks) and hernial protrusion. Anatomic closure without undue tension is not usually possible, on account of marked loss of muscle tissue. A plastic overlapping, on the principle of the Mayo operation for umbilical hernia, is accordingly advisable. The overlapping should be vertical rather than from side to side. Excessive overlapping, promoting failure because of undue tension, is to be avoided; 2 centimeters is often better than 5. Twenty-day chromic gut No. 1 or 2 is the suture material of choice. Where closure is imperfect because of absence of muscle tissue, the writer prefers strengthening by woven narrow strips of fascia lata to a mass implant of fascia lata. In closing the superficial layers, tension sutures of silkworm gut, to remain 15 or 18 days, are useful provided the abdominal walls are thin-not in the obese. Drainage with the ordinary tube not being wholly satisfactory, the writer packs the wound with rubber tissue, closes it about halfway and leaves stitches in the other half of the wound to be tightened in 48 hours, after removal of the rubber. The results of the operation are good, but recurrences fairly common; 22.48 per cent. of the 596 patients have weak wounds with more or less bulging, while 5.7 per cent. complain of slight inconvenience and 3.35 report no improvement. The mortality was 1.78 per cent., but in massive hernias with strangulation McGlannan estimates the mortality as high as 50 per cent.

POST-OPERATIVE TREAT-MENT.—Posture.—The value of posture after operation as a means to hasten recovery and avoid complications has been emphasized by Willy Meyer (Med. Jour. and Rec., June 18, 1924). He is convinced of the ef-

ficacy of a slight Trendelenburg posture in the prevention of femoral and pelvic thrombosis, and has blocks placed under the foot of the bed after all operations at or below the level of the heart, and also in weak patients after operations above the heart. This posture overcomes the normal anatomical impediment in the circulation of the lower extremity at Poupart's ligament and further up the pelvis, and he has not seen the typical thrombosis of the left femoral vein since starting this practice. Four sizes of blocks—5, 6, 7 and 10 inches high-are used, as well as special "steps" for higher elevations. The preventive effect of posture is regularly assisted by frequent motions, especially of the left leg-"bicycle riding in bed,"-by deep breathing exercises during the first week or 2 after operation, and, in weak patients or after severe operations, by injections of camphor, caffeine and digitalis continued for a number of days and followed by oral use of the same drugs.

After cholecystectomy, with drainage of the gall-bladder or ducts, and after appendectomy with drainage, the writer places the patient in the right Sims posture as soon as he leaves the operating table; this is maintained for 18 to 20 hours, when a slight turning of the body to the left is permitted. On the third day, the patient turns on his back and the foot of the bed is raised on blocks until he gets up.

After gastroenterostomy, to minimize vomiting, the right Sims posture with the *head* of the bed slightly raised is used until the third day; then the blocks are transferred to the foot of the bed.

After operations for general septic peritonitis with drainage, he combines the Sims with the Fowler posture; in some cases, with 2 drains into the small pelvis and lumbar region, the patient is placed on his abdomen with the head of the bed on blocks.

Gas Pains.—For gas pains and shock, C. G. Wilson (Cal. and West. Med., July, 1924) recommends 10 per cent. magnesium sulphate stupes, applied at 105 to 110° F. over the whole abdomen and sealed wound, and changed every hour. The stupes consist of 4 to 6 thicknesses of flannel and are kept hot with the hot water bag or electric pad.

According to G. de Tarnowsky (Jour. Amer. Med. Assoc., May 10, 1924), the conviction is growing that the rectal drip tends to produce reverse peristalsis of the descending colon, with gas retention. Preference is now given to subcutaneous or intravenous saline injections in the presence of dehydration. The patient should have warm fluids by the mouth as soon as he can swallow. The writer is not convinced that postoperative therapy to increase peristalsis is logical or desirable.

Severe Abdominal Hemorrhage or Acute Peritonitis.—After operations for such conditions G. W. Crile (Ohio State Med. Jour., Dec., 1923) applies the following measures: (1) Modified Fowler's position. (2) Hot packs over the abdomen, extending well down over the sides. (3) Bartlett's solution, 2000 to 4000 c.c. (2 to 4 quarts) or more by hypodermoclysis every 24 hours. (4) Blood transfusion, if required. (5) Morphine in repeated doses (except in gall-bladder operations) until the breathing rate

is 10 to 14. (6) Maintenance of the utmost possible degree of negativity, with avoidance of all unnecessary disturbance of the patient. In the acute stage of peritonitis, no attempt is to be made to move the bowels; later, only gentle enemas should be used. Morphine may be given in adequate dosage until the end of the critical stage.

Removal of Sutures.—To avoid pain and possible breakage in the removal of deep sutures, F. L. Smith (Jour. Amer. Med. Assoc., Jan. 19, 1924) has his patients carry out deep abdominal breathing and draws on the sutures gently during inspiratory and, at times, during expiratory motion of the abdominal wall. Alternate distention and retraction of the abdominal wall will usually loosen sutures that do not come out on gentle traction.

ABDOMINAL CONTU-SIONS.—In the diagnosis and treatment of injury to internal organs in contusions of the abdomen, detection of the earliest evidences of beginning peritoneal irritation is of great importance, as is brought out by R. Reichle (Beitr. z. klin. Chir., cxxxi, 185, 1924). Such evidences are wont to appear in 2 or 3 hours, and may eventuate in an active peritonitis. A significant finding is abdominal rigidity, as is also a gradual rise of temperature in the few hours following the injury. Too much stress should not be laid on vomiting. The mortality after such injuries—60 to 80 per cent.-is much higher than after open wounds, the latter being operated on sooner. A diagnosis of visceral injury calls for operative intervention. Among 104 cases of abdominal contusion there were 17 of ruptured bowel, 6 of ruptured mesentery, 3 each of intra-abdominal hemorrhage and of operation with negative findings, and 1 of ruptured kidney. Of the 17 cases of ruptured intestine, 2 died unoperated; of the 15 operated, 6 recovered.

Of the total of 104 cases, 70 did not require operation.

Ruptures of the colon or duodenum are particularly dangerous. Persistent appearance of blood in the stools is apt to herald a secondary or late perforation of the bowel.

In the treatment of abdominal contusions, a hot bath acts favorably on the general condition. In operating, suture of the ruptured parts usually suffices; resection should be avoided, if possible. Saline irrigations are useful.

A slowly developing, non-septic type of peritonitis following abdominal trauma and due to the action of the latter on the sympathetic has been described by W. U. Kennedy (Ind. State Med. Assoc. Jour., July, 1922) on the basis of observations in 5 cases. The history is one of transient shock, a persistent abdominal rigidity, persistent nausea, a more or less fixed doughy mass, obstinate constipation increasing in severity, a nearly silent abdomen with peristalsis, if any, abruptly terminating at a fixed place, and gradual toxemia from intestinal stasis. The X-ray shows an ill-defined mass of barium in the small intestine and definite delay in the head of the meal reaching the cecum. In acute cases, laparotomy should be immediate, with loosening of the widespread adhesions and covering of the raw surfaces with the adhesions themselves, omental flaps and cargile membrane. In chronic cases a short-circuiting operation or even a resection of agglutinated intestine may be indicated.

ABDOMINAL PAIN.—Pains referred to the upper abdomen are grouped by C. H. Peck (Surg., Gyn. and Obst., Feb., 1924) thus: (1) Conditions within the chest or about the diaphragm, as pleurisy, pneumonia, pulmonary infarct or abscess, aneurism, mediastinal inflammation or neoplasms, angina pectoris; also, the pain of liver congestion in cardiac decompensation and that of perihepatitis. (2) Pylorospasm and "writhing duodenum." (3) The gastric crises of tabes. (4) Peripheral nerve pains due to spinal nerve root pressure, local neuralgia or neuritis, or the early stages of herpes zoster.

While gall-bladder pain is generally on the right, it may be maximal in the midline or atypical, the writer having removed a gall-bladder full of calculi from a woman who for 3 years had had acute attacks of upper abdominal pain always referred to the left costal margin, with no local tenderness. Of the upper abdominal pains originating at a distance, appendicitis, acute and chronic, is the most frequent cause, epigastric pain being common in both forms. The pain of high retrocolic appendices may closely simulate gall-bladder or right kidney disease. The writer removed an acute perforated appendix in a case in which for 7 years repeated attacks of pain had been persistently located high up to the left near the splenic region; the long appendix ran upward and to the left, with its tip across the midline. Pain in kidney lesions is usually lumbar and radiates to the bladder, genitals or thigh, but in acute infections, especially of the unilateral hematogenous type, it may be referred to the upper abdomen. Other possible causes of upper abdominal pain are subphrenic, hepatic or perinephritic abscess, thrombosis or phlebitis of the portal vein, mesenteric thrombosis, enlarged retroperitoneal glands due to tuberculosis, Hodgkin's disease, sarcoma or metastatic growths, malignant disease of the upper abdominal organs, adhesions, small epigastric hernias in the midline above the umbilicus, subdiaphragmatic and internal hernias, abdominal aneurisms, and vertebral or costal osteomyelitis or neoplasm.

V. Z. Cope (Brit. Med. Jour., Apr. 19, 1924), considering the differentiation of acute abdominal from acute thoracic conditions, notes that colicky pains, indigestion, constipation and diarrhea usually indicate abdominal disease, while in chest conditions there is generally a history of a cold or chill or exposure to infection. He tabulates the diagnostic characteristics of the 2 groups of conditions as follows:

> ABDOMINAL CONDITIONS.

Acute onset without fever (except in pye-litis). Pyelitis some-times begins with a chill.

Collapse and vomiting relatively frequent.

continuous spasmodic. In biliary colic and leaking duodenal ulcer someincreased times respiration.

Local tenderness and rigidity over foci. Pallor: sunken eyes; anxious expression.

decubitus with flexion of thighs.

Skin cold and moist or normal. Temperature normal or subnormal.

Immobility of abdom-inal wall (important if in lower abdomen).

CHEST CONDITIONS.

Acute onset with fever. In pulmonary c ditions a chill common.

Collapse relatively rare. Vomiting rare except in cases of children.

Pain increased by respiration.

Flushing of cheeks; herpes; dilatation of alæ of nose in pulmonary conditions.
Position in bed, lateral decubitus in pleur-isy and pneumonia; propped up in cardiac conditions. Skin hot and dry.

Temperature high.

Ratio of pulse to respiration reduced to 2:1.

ARDOMINAL CONDITIONS

Phrenic pain common above clavicle.

Cutaneous hyperesthesia common.

Unilateral pain, sometimes associated with tenderness on oppo-site side of abdomen. Psoas test: flexion, extension, and hyperextension cause pain in iliac fossa.

Obturator test: ternal rotation of flexed thigh causes pain in cases of pelvic abscess or inflammation contiguous to obturator internus.

Testicular pain may be present. examination tender-

Rectal exami may reveal t ness or lump. Usually only a râles in chest. a few

CHEST CONDITIONS.

> Phrenic pain common below clavicle in pulmonary conditions. Cutaneous hyperesthe-

sia rare and never below navel. Unilateral pain not as-sociated with pain on opposite side of

abdomen.
Psoas test: flexion, extension, and hyper-extension do not cause pain.

Testicular pain never present.

Except in early stages, there is a rub, dullor bronchial breathing.

According to F. Brüning (Berliner klin. Woch., Apr. 22, 1924), a distinction should be made between contraction pains and distention pains in the hollow abdominal viscera. Whether a pain is referred by the patient to the actual seat of disturbance or not depends on whether the parietal peritoneum is irritated or not. Peritoneal pain alone is transmitted directly along spinal afferent nerve-paths, whereas irritation in the viscera themselves is transmitted along the sympathetic, with the result that it is referred, not to the actual seat of trouble, but to the celiac ganglion of the sympathetic, and is felt as epigastric pain, the spinal nerve fibers starting from the celiac ganglion. Contraction pain is transmitted in this latter way, whereas distention pain is, as a rule, correctly localized by the patient because the distended intestinal loop exerts pressure against the parietal peritoneum and thus irritates spinal sensory The fact that the upper nerves. spinal segments for the parietal peritoneum begin in the thoracic portion of the cord and may be irritated directly in lung disorders accounts for the frequent reference of pain to the abdomen in pneumonia in children and the laparotomies often mistakenly carried out in this condition. Contraction pain occurs in its purest form in acute enteritis, and is met with in intestinal obstruction from various causes. Apart from the intestinal wall, it may be caused by contraction and stretching of the mesentery. In contraction pains the point of origin of the pain is insensitive to pressure.

> De Mussy's point, a point of marked tenderness on the line of the left border of the sternum, has been considered pathognomonic of diaphragmatic pleurisy, but according to the tests of F. Högler and K. Klenkhart (Wien. Arch. f. inn. Med., Oct. 15, 1922) in 200 cases, it may be met with also in disease of the abdominal viscera on the right side. It is an evidence of irritation of the phrenic nerve. When it is pronounced on the right side, and the pleura and lungs are negative, an inflammatory process in the gall-bladder region is suggested. It was absent in gastric ulcer or cancer and in other gastrointestinal affections. In 5 cases of gall-stones, it was the only sign present in the intervals between attacks of colic.

H. L. Prince (N. Y. State Jour. of Med., Feb., 1923) maintains that the relative ease of diagnosis and absolute ease of surgical treatment in appendicitis have tended to obscure other causes of abdominal symptoms. When a patient with a chronic history complains of pain in the right lower quadrant and is tender on examination, the appendix is the last thing to consider, and not the first, unless there can be determined a history of colicky midline pain, in which case the appendix should be considered as possibly suspicious.

According to G. Sophoterow (Wratsch, Mar., 1924), the position of the umbilicus is of significance as an indication of the developmental peculiarities of the gastrointestinal tract in different individuals, as well as in diagnosis. When there is pain in the liver region in subjects with a low umbilicus, subdiaphragmatic appendicitis is suggested, while if the umbilicus is high, atony of the transverse colon is frequently present, as are also pseudoappendicitis, hemorrhoids, gall-stones, or duodenal or pyloric ulcer.

Routine pyelography is advised by E. B. Fuller (Med. Jour. of So. Africa, Mar., 1924) in cases of abdominal pain the cause of which cannot be definitely found. In 5 cases of recurring attacks of abdominal pain, usually unilateral but sometimes of more general distribution, in which the appendix, ovary or gall-bladder had been dealt with surgically without result, pyelography showed the cause of the pain to be a kinking or distortion of the ureter.

In the experience of V. Z. Cope (Lancet, Jan. 19, 1924), cutaneous hyperesthesia has proven of assistance in the diagnosis of acute abdominal disease. Employing a pinch test or light pin stroke, he found it present in 47 per cent. of all cases of "acute abdomen," including 59 per cent. in 185 cases of acute appendicitis. It nearly always implies inflammation or irritation of a viscus or of some part of the peritoneum. In the majority of the appendicitis cases the hyperesthesia lay between Poupart's ligament and a horizontal line from the umbilicus. In 8 instances there was hyperesthesia on both sides. Hyperesthesia was also noted in a varying ratio of cases in the following conditions: Perforated gastric or duodenal ulcer, cholecystitis, gallstones, primary peritonitis, salpingitis with pelvic peritonitis, acute tuberculous peritonitis, ovarian cyst with twisted pedicle, renal colic, pyelitis, abscess of the spermatic cord, intestinal obstruction and acute dysentery. Hyperesthesia is usually most definite and extensive in young adolescents.

Greater precision in the localization of tender points in the abdomen may be obtained, according to Del Valle (Prensa Med. Argent., Oct. 30, 1922), by placing the hand on the abdomen and lightly tapping the knuckle of the flexed forefinger, the distal phalanges of which are held perpendicular to the skin surface, with the percussion hammer. The tissues are jarred precisely along the axial prolongation of the flexed portion of the finger. With this procedure the writer was able, e.g., to differentiate disease of the gall-bladder in a case of chronic dyspepsia in which the symptoms were solely gastric, and to make other fine diagnostic distinctions.

The value of X-ray examination in obscure acute abdominal cases is brought out by D. Y. Keith (South. Med. Jour., Feb., 1924). Often the use of barium is unnecessary, e.g., in complete pyloric or duodenal occlusion. Rupture of the diaphragm after severe abdominal trauma, with entrance of some abdominal organ into the chest, is revealed by the ray, as are also the rapidly growing ovarian cyst and the pelvic fracture which sometimes accompanies traumatic rupture of the bladder.

ABDOMINAL WOUNDS.—Out of 52 cases of perforated abdominal wounds reported by W. L. Condict (Ann. of Surg., July, 1924), 20 were gunshot wounds and 32 stab wounds. In the former group the mortality was 45 per cent. and in the latter group, 28 per cent. The interval between injury and operation ranged from 1½ to 24 hours, the average being a little over 2 hours. One case

recovered without operation. Wounds of the abdominal organs comprised: Liver, 12 cases; stomach, 10; jejunum and ileum, 6 each; kidney, 3; descending colon, transverse colon, and spleen, 2 each; sigmoid, gall-bladder, common bile duct, and pancreas, 1 each. The advisability of immediate laparotomy in such wounds, with thorough examination of all organs, is emphasized as affording the best chance of recovery to the patient.

In a case reported by R. O. Mc-Alexander (Jour. Ind. State Med. Assoc., June, 1923), a woman had introduced into her uterus a celluloid crochet needle 5 inches long, blunt end first, to induce abortion. She lost control of it, but experienced no symptoms. Later, becoming alarmed, and feeling an occasional slight sticking pain in the abdomen, she sought medical advice, but the foreign body could not be located either by palpation or the X-ray. At laparotomy the needle was found hooked in the omentum, with the other end free. No signs of injury to the pelvic organs were seen. Recovery followed.

TREATMENT.—In a series of 127 abdominal injuries dealt with by J. M. Mason (Ann. of Surg., Mar., 1924) 108 were gunshot wounds, 18 stab wounds and 1 a crushing injury with rupture of the spleen. mortality was 58.2 per cent. writer believes the high mortality of such cases due not so much to visceral injury as to the associated hemorrhage. He divides his cases into a "small hemorrhage" group, with a mortality of 36.1 per cent. where there was visceral injury, and a "large hemorrhage" group, with a mortality of 87.2 per cent. in the operative cases. To reduce mortality in the first group, he mentions as essentials: Early operation, refinement of technic, more general substitution of local anesthesia, nitrous oxide or ethylene for ether, and very careful after-treatment. In the large hemorrhage cases blood transfusion should, in addition, be availed of.

L. W. Hefferman (Brit. Med. Jour., Feb. 2, 1924) records a case of severe stab wound, seen 5 hours after the injury, in which operation revealed section of the 8th costal cartilage, an opening 3½ inches long in the diaphragm, and injury to the spleen, a portion of which had been slashed off. In addition there was a tear in the omentum near its attachment along the greater curvature of the stomach and an opening in the posterior wall of the latter organ, with escape of gastric contents. After suture of these various injuries the patient recovered.

In a case of abdominal wound by revolver shot seen by Glass (Deut. med. Woch., June 6, 1924), laparotomy, which was carried out within fifteen minutes after the injury, revealed 8 perforations of the small intestine, 5 of the colon, and 3 of the mesentery, with a wound of the bladder, and the presence of urine, feces and gas in the peritoneal cavity. Recovery followed suture of the several orifices.

A. Paulino (Brazil méd., Aug. 9, 1924) issues an additional warning against the probing of abdominal stab wounds, which, aside from the risks it entails, may prove misleading. In a case he saw, the wound had been probed 3 times in succession by a druggist, a physician and a hospital interne, all of whom were led by the resistance to the probe to the conclusion that the wound was merely superficial, while operation revealed a stab oblique in direction with injury to the bowel. A partial intestinal perforation may be converted into a complete one by probing.

**ABDOMINOSCOPY.**—This procedure is described by O. P. Steiner

(Surg., Gyn. and Obst., Feb., 1924) as an endoscopy of the abdominal cavity, constituting a new means of diagnosing abdominal diseases. In early trials in ascites cases and in the cadaver the procedure proved unsatisfactory, but in bodies examined immediately after death, results far beyond the writer's expectation were at once obtained, and in the living subject with air inflation of the peritoneal cavity they were even better.

The "abdominoscope" resembles a cystoscope. Its adjustable curved end is used as a guide in endoscopic vision as well as to keep various organs out of the field, as a tractor, and to palpate for the consistency and movability of organs and the presence of gall-stones. A canal is provided in the instrument for the entrance of air, which, filtered through sterile cotton, is pumped in with a bulb. A trocar is used to make the opening, and the cannula inserted with it consists of only a half-tube, to avoid making the opening too large. Preparation of the patient comprises a purge the day before, 1/4 grain (0.015 Gm.) of morphine 20 minutes before puncture, cleansing of the field with benzine and with alcohol and iodine, and local anesthesia with novocaine. Upon removal of the trocar, introduced steadily and cautiously through the contracted abdominal muscles, the abdominoscope is slipped in along the half-tube (cannula) and the latter then removed. The abdominal cavity is inflated slowly with the bulb, and after the examination what air remains is pressed out with the hand placed flat on the abdomen, the wound closed with one suture, and iodine and a small dressing applied.

A view of any desired portion of the abdominal cavity is obtained by changing the position of the patient so that that portion is uppermost, the air always staying at the top and permitting a view of the structures beneath. From a puncture slightly below and to the side of the umbilicus, one can see not only a good deal of the organs of the upper abdomen but also, by rotation of the endoscope, the region of the symphysis. Usually knowing in advance the region where the pathologic condition is situated, one may make the puncture in that vicinity. Puncture above the umbilicus affords a good survey over the upper abdomen when the thorax is Palpating between the stomach and liver brings additional parts into view. With a puncture low down, the uterus, tubes, ovaries and sigmoid are seen almost as well as by laparotomy. The writer emphasizes the possibility of early and correct diagnosis of doubtful abdominal conditions, with more prompt decision as to the advisability of operation in cases with grave pathologic conditions. Its value in gynecologic cases is especially alluded to. The procedure is no more difficult than cystoscopy and causes no pain

#### ABORTION.-ETIOLOGY.-

or shock to the patient.

The causes of abortion are sometimes apparently insignificant ones. Thus, L. Drosin (N. Y. Med. Jour., Nov. 7, 1923) points out that in many cases one is able to find no more definite cause than obstipation, or stair climbing to the top floor, or a combination of such factors. Normal anteversion or anteflexion of the uterus is exaggerated during the early part of ges-

tation, and unless this flexion is overcome by general or partial softening of the uterus or its supports, as the organ enlarges the fundus approximates and often actually impinges upon the symphysis pubis. This results in continuous irritation of the uterus, especially during active motion, supplemented by the pressure of the relatively full bladder, which is unable to fill as completely as in the non-pregnant state; constipation may further exert counterpressure on the uterus, causing hyperemia. the vagina is long and narrow, keep ing the uterus high and preventing an increase in its blood supply through pressure, anemia of the lower part of the corpus uteri results and the embryo dies from insufficient nutrition. Similar effects are produced by rigid ligaments, a short vagina that fails to stretch, or uterine fibrosis or hypertrophy, especially when associated with adhesions. Conception in an infantile uterus also promotes abortion. In 3 cases the writer found an umbilical cord so tightly twisted as to cut off the blood supply to the embryo, with no other cause of abortion discernible.

In the case of a woman four months pregnant reported by E. Borger (Zentr. f. Gyn., Feb. 2, 1924), sudden inability to pass urine was associated with severe abdominal and renal pains. Two liters of urine were withdrawn from the bladder, whereupon, in the course of three days, the evidences of imminent abortion subsided.

#### THREATENED ABORTION.—

Aside from the predisposing causes, with or without bleeding, and the time, viz., usually between the tenth and twelfth weeks of gestation, Drosin (loc. cit.) calls attention to the following clinical picture in threatened

abortion: A large, unusually hard uterus with descensus, immovably fixed and anteflexed, and with the fundus forming a hard crest or spine which is behind or impinges upon the symphysis. This condition results in abortion unless the uterus can soften and rise out of the pelvis.

In the treatment of threatened abortion, no ergot should be given but, as specified by D. S. Hillis (Surg., Gyn. and Obst., Jan., 1924), the patients treated with rest, sedatives and ice-bags to the lower abdomen.

INEVITABLE ABORTION.—In this condition, bleeding is more profuse, pains more distinct, and there is disappearance of flexion at or above the internal os, with cone-shaped corpus and cervix and some dilatation of the internal os. Drosin finds, however, many cases with bleeding as the only symptom and with the uterus supracessed (ascended) and devoid of its characteristic cystic feel, and the vagina tensely drawn up and widened out, enclosing a hollow space which disappears after abortion. All such cases aborted in two or three days. In the absence of any symptom but bleeding, the appearance of the discharge is of diagnostic significance. A muddy, dirty ashen discharge, or a mucosanguineous discharge with much mucus, dirty vellow and of soft cheesy consistency, is at least evidence of a threatened abortion. But if the finger brings away a thin, transparent albuminosanguineous fluid containing translucent particles, the edges of which merge with the containing medium, decomposition of the amniotic membrane and death of the fetus are indicated.

In treating inevitable spontaneous abortion, Drosin recommends hypodermic injection of 1 c.c. (16 minims) of aseptic ergot, which will prevent or minimize hemorrhage, even without vaginal packing, and bring on pains—if they are not present—within 24 hours. As a further precaution against hemorrhage, one should watch for distended bladder and impacted rectum. In most cases, however, the uterine content is not completely expelled, and the writer advocates, with due discrimination, aseptic curettage immediately, or in 24 hours if bleeding is not profuse, in order to obviate unfavorable sequelæ. A preliminary douche followed by swabbing out of the vagina with an antiseptic solution is advised, and pituitrin is given immediately before the curettage, reducing bleeding to a minimum, facilitating prompt evacuation by detachment of the ovum, hardening the uterus so that it offers more resistance to the curette, and hindering toxic absorption. A sharp curette is preferred to a dull one, except in parametritis, as it stimulates uterine contraction. Lastly, the uterus is swabbed with undiluted tincture of iodine from cotton on dressing forceps. In a chronic subinvoluted or fibrosed uterus with little tendency to contraction after evacuation, pituitrin may be given also after the curettage. In cases in which curettage is contraindicated or undesirable, repeated tight vaginal packing with aseptic or antiseptic gauze, with 1 or 2 injections of pituitrin, will accomplish similar results.

Abortion

In the course of a comparative study of the results of active and conservative treatment in 1000 cases of abortion, reported by Hillis (*loc. cit.*),

the cases of inevitable abortion with normal temperature treated actively were curetted on the fifth day after admission if there was any reason for the procedure, while the cases treated conservatively were not curctted unless bleeding threatened life or bloody discharge persisted over 10 days. Curettage was performed with the finger, ovum forceps or curette, according to the cervical dilatation present. Fifty out of 530 afebrile patients had such alarming hemorrhage that curettage was carried out before the end of the 5-day period. Cases with a 5-day rest period were found more likely to remain with a normal temperature than cases curetted before the end of this period.

INCOMPLETE ABORTION.—A conservative form of treatment in incomplete abortion is advocated by J. Lovrich (Münch. med. Woch., Oct. 5, 1923), who administers 1 gram (15 grains) each of quinine and barbital in 5 divided amounts in 1 day. At the onset of pains he gives 3 or 4 intravenous injections of pituitary extract at intervals of 10 or 15 minutes. In 324 cases of abortion in which this treatment was applied the mortality was less than 1 per cent.

SEPTIC ABORTION.—Additional studies of the bacteriology of febrile abortion have in recent years been published. W. B. Moody (Amer. Jour. of Obst. and Gyn., Jan., 1923), in women succumbing to sepsis following abortion, found the hemolytic streptococcus more often than other organisms, such as the colon bacillus and staphylococci. He suspects that the hemolytic streptococci may be present in the lochia, some outside influence, however, e.g., trauma

from instrumentation or douches, being necessary to induce general system infection.

G. Winter (Zentr. f. Gyn., Sept. 22, 1923) found a mortality of 15.5 per cent. in streptococcus infection; 8 per cent. in staphylococcus infection; 3.1 per cent. in colon bacillus infection, and 20.8 per cent. in hemolytic streptococcus infection. The results following removal of the remnants of the ovum varied considerably according to the variety of infection and the local conditions present. In the case of the hemolytic streptococcus such removal was followed by a 30 per cent. mortality, and with nonhemolytic streptococci, 16.4 per cent. Intervention in the presence of general sepsis or diffuse peritonitis showed a very high mortality. Perimetritis did not appear to contraindicate intervention. In regard to the relative merits of the finger and blunt curette, the former showed a mortality of 3 per cent. in 4000 cases and the latter, of 2.6 per cent. in 2000 cases. On the whole, the writer favors abstention from intervention in abortion with inflammatory complications. Where there has been fever, intervention should be undertaken only after the temperature has been relatively low for 4 or 5 days.

In the discussion as to the comparative merits of active and conservative treatment, the weight of opinion appears to be further leaning in the latter direction. In Hillis's (loc. cit.) important study of 1000 cases, 189 out of 499 cases treated actively were curetted, as against 52 out of 501 cases treated conservatively. The procedure followed in the "active" group of febrile cases was, if bleeding indicated that the uterus had not been emptied, to curette after the temperature had reached normal and then remained afebrile for 5 days. In the "conservative" group, curettage was performed only if bleeding persisted more than 10 days and the temperature remained normal. Ovum forceps were, whenever possible, substituted for the curette in emptying the uterus in the presence of fever. The general conclusion reached is that conservative treatment of abortion in febrile cases gives better results than active therapy. A rest period of 5 days' normal temperature is advised for both febrile and afebrile cases. Out of the total of 1000 cases, 22 per cent. were of criminal or self-induced abortion; 76 per cent., of apparently spontaneous abortion, and 5 per cent., cases with recognized pelvic pathologic conditions. Of the 20 fatal cases, 16 were known to have been criminal abortions and only 1 was known not to have been a criminal abortion. Fourteen of the 20 fatal cases had shown evidence of extra-uterine infection at the time of admission.

> E. Bovin (Hygiea, Dec. 31, 1923) records a mortality of 1.3 per cent. in the 54 per cent. of 1141 febrile cases in which strictly expectant treatment was employed and of 2.9 per cent. in 518 cases of active intervention. In 156 cases in which uterine evacuation was not carried out until the fever had subsided the mortality was 1.9 per cent., while in 75 cases in which intervention occurred before subsidence of fever the mortality was 8 per cent. He regards the risk of spreading infection by active measures as greater than that of allowing the infectious focus to lie quietly in the uterus. He advises waiting at least 6 days from the subsidence of fever before intervening.

On the other hand, Burghardt (Deut. med. Woch., July 18, 1924) points to 53 cases of infected abortion treated actively with but 1 death, and advocates such treatment exclusively. He prefers curettage to

the use of the finger on the ground that it is more aseptic and does not necessitate as much dilatation of the cervix.

Active treatment gave favorable results in the hands of F. Grabich (Monats. f. Geb. u. Gyn., Nov., 1923) in 100 abortion cases curetted on account of hemorrhage. He deems it unnecessary and inadvisable to irrigate the uterine cavity in these cases. Ergot is given, an ice-bag applied and roborant measures carried out.

K. Laemmle (Zentr. f. Gyn., Feb. 9, 1924) would settle the question as to the best type of treatment by the statement that the end-results of active and of expectant treatment in febrile or afebrile cases without pronounced hemorrhage are equivalent, the former having advantages, however, in reducing the duration of treatment and causing less disturbance of general health.

Vigorous quinine treatment in febrile abortion is recommended by E. Henrard (Monats. f. Geb. u. Gyn., May, 1923), who combines intravenous injection of 2 c.c. (32 minims) of a 25 per cent. solution of quinine hydrochloride with intramuscular injection of the same amount and 2 tablets of 0.25 Gm. (4 grains) each by the mouth. In 80 per cent. of 92 cases in which abortion had begun, this treatment was followed by spontaneous emptying of the uterus; the same result occurred in 50 per cent. of all cases with retained placenta. While unable to excite expulsion of placental remnants, the drug dilated the os, liberated the placental remnants, thus rendering manual evacuation easier.

Ergot is used to control any resulting hemorrhage, or, if this drug fails, active intervention is undertaken when the blood loss approaches 800 or 1000 c.c.

In no case, especially of febrile abortion, should active intervention be undertaken, according to R. Poschacher (Wien. klin. Woch., Aug. 9, 1923), until quinine has been tried. He gives 4 doses, each of 0.25 Gm. (4 grains) of quinine sulphate, at quarter hour intervals. The further along the patient is in pregnancy, the more satisfactory the results, especially where the uterus still contains the fetus and placenta.

Vaginal hysterectomy is being further employed by some observers in certain cases of abortion. Thus, J. P. Tourneux (Bull. Soc. d'obst. et gyn. de Paris, May 25, 1923) records 3 cases of peritonitis following abortion, in 2 of which medical treatment had previously failed. Two of the cases recovered. The advantages of vaginal over abdominal hysterectomy in such cases lie in the shorter duration of operation, less shock, and elimination of the risk of general peritoneal infection. Pfeilsticker (Zentr. f. Gyn., July 26, 1924) performed the same operation in 14 cases for severe hemorrhage attending abortion.

INDUCED ABORTION. — Discussing the indications for therapeutic abortion met with in his experience with 2000 cases of curettage in the presence of an intact pregnant uterus, J. A. van Dongen (Nederl. Tijdschr. v. Geneesk., Feb. 10, 1923) emphasizes the need of a consultation between the attending physician, an expert obstetrician and a specialist in the disease threatening the patient's life before such an abortion is decided upon. In cases of progressive pulmonary tuberculosis or threatening cardiac disease, abortion was followed by survival for almost a year or to the time of writing, and in 1 tuberculous case the disease became stationary. In 1 case abortion was induced for a maxillary sinusitis which had returned 5 times in previous pregnancies and in the last instance had involved other sinuses and the brain. In another case, abortion was induced for advanced pyelitis in preference to irrigation of the renal pelvis, which is difficult and unreliable in advanced pregnancy. Hyperemesis and chronic kidney disease were not in any case considered adequate justification for therapeutic abortion.

When a therapeutic abortion is called for, it is well to wait, according to Drosin (loc. cit.), until the uterus is sufficiently softened, as there will then be less cervical trauma and shock and the uterus will contract more readily during the emptying process and remain fully contracted, avoiding the "reaction" which otherwise sometimes follows. Where uterine contraction during curettage is insufficient and profuse bleeding continues or soft, adherent tissue is felt at or above the internal os, further dilatation and special care to dislodge the tissues above the level of flexion are helpful. For the latter purpose the shank of the curette may be bent near its tip. In a uterus too soft to lend itself well to curettage, pituitrin should be given before continuing the procedure, first over the lower half of the uterus, then at the fundus. Eleven cases of very soft, cystic uterus-ballooning out of the uterus-have been met with by the writer. All these patients were highly neurotic and the condition is regarded as a failure of the organ to contract owing to temporary suspension of its nerve control. All had profuse hemorrhage, but quickly rallied upon complete evacuation of the

uterus. In such cases pituitrin should be given to harden the uterine wall before starting or continuing the curettage. A sluggish uterus can also be made to contract temporarily by directing the patient to bear down strongly, the curettage being continued during the straining move-Except in primiparæ, the ments. use of anesthesia can generally be After the curettage, the avoided. uterine cavity is always swabbed with pure tincture of iodine, but no uterine drain, vaginal pack or intrauterine douche is ever employed.

ABORTION, TUBAL.—Especial attention has been directed by F. Lejars (Bull. de l'Acad. de méd., Mar. 18, 1924) to the apparently increasing frequency of cases of early tubal abortion, occurring in the first few days or weeks of pregnancy, often presenting misleading clinical features, and consequently often overlooked. Out of 113 laparotomies for tubal pregnancy, 33 were emergency operations on account of threatening hemorrhagic anemia, but only in less than half of these cases was the condition one of free hemorrhage immediately following rupture; in the remainder, the initial hemorrhage had become encysted, and the hematoma fissured or ruptured some days later. Such a condition, especially with febrile movements, misleads the observer and tempts him to keep the case under observation, although actually the risk of sudden, secondary rupture is present all the time. There were 4 deaths from primary or secondary rupture in the series. Among the 80 laparotomies for definite hematoceles dating back a more or less considerable time, the writer sets apart a group of hematoceles or hematosalpinges of moderate or small size, resembling small cysts or fibroids, which actually represent early tubal abortions. In these early cases, hemorrhage is not copious, the bogginess or mass behind or at the side of the uterus is indistinct and recognized only late, and the condition is apt to be taken for ordinary uterine abortion; curettage may be mistakenly performed for the tubal abortion, and is not always harmless. There are, however, distinctive evidences, with which the physician should be familiar: The onset is generally marked by sudden acute pain and transient peritoneal reactions; blood flows continuously, but no massive aggregate of blood passes out, as in uterine abortion; palpation elicits distinct tenderness on one side, and a few days later, bogginess becomes perceptible on that side. These lateral masses remain for a long time, and may lead to manifold diagnostic errors.

[See also ECTOPIC GESTATION.]

ABSCESS .- ACUTE .- In abscesses in which an incision smaller than the diameter of the abscess is sufficient, or in abscesses deeper than they are wide, including acute ischiorectal and breast abscesses, J. B. Stenbuck (Amer. Jour. of Surg., Feb., 1924), after evacuation of the focus, advocates packing of the abscess cavity with iodoform or plain gauze under pressure, so that tension within the cavity is raised beyond what it had been before evacuation of the Exceptions to this procedure are cases in which pressure on a vessel might lead to rupture into a serous cavity. It is not painful if carried out just after the operation. The dressing consists of a wet compress of sterile water, saline or boric acid solution, to be kept wet and taken off only after 48 hours, at which time the abscess cavity regularly exhibits a red granulating surface.

In subungual abscess, E. L. Eliason (Ther. Gaz., Dec., 1923) uses a wet dressing of alcohol, boric acid or magnesium sulphate and has the finger immersed in the hot solution every 3 or 4 hours for 10 minutes. subepithelial abscess of the finger-tip, the focus, if seen early, may be opened with a cataract knife, introduced in a direction parallel to the surface; any extensive area of raised epidermis should be removed with scissors. In throbbing finger-pulp with central necrosis, a transverse incision across the finger-tip, 1/8 inch from and parallel to the nail should be made within 24 hours under general anesthesia, a tourniquet being used. The flap thus raised is not fixed in its place again until sloughing of the necrotic tissue has occurred. Meanwhile soaks in a hot solution are prescribed.

ISCHIORECTAL.—Lockhart-Mummery (Proc. Roy. Soc. of Med., xvi, Surg. Sect., 65, 1923) has described a new procedure for the treatment of ischiorectal and other abscesses: After evacuation through a crucial incision, the skin forming the outer wall of the abscess is cut away completely, leaving an opening an inch or more in diameter into the cavity. Without doing anything to the interior of the abscess, a flat, moist antiseptic gauze dressing, large enough to absorb all discharge for 12 hours, is simply applied and covered with a protector to maintain

moisture and prevent adhesion of the dressing to the margins of the wound and interference with drainage. Merely a shallow ulcer remains when the dressing is later changed, the abscess cavity having disappeared. The ulcer heals within 10 days or 2 weeks and no residual abscess, fistula or marked scarring results.

**SUBPHRENIC.**—The difficulty of recognizing subphrenic abscess in the absence of a history of an acute abdominal condition is commented upon by B. Akerblom (Acta med. scand., Jan. 24, 1924). In 2 of his 4 cases the only apparent source of the condition lay in furuncles which had run their course a few weeks before the initial symptoms of the abscess. In another there had been a lung infection, presumably bronchopneumonia, while in the fourth a definite cause for the abscess was discovered, viz., a ureteral calculus with pyonephrosis. Prompt recovery followed evacuation of the abscess in each case.

In 3 of F. M. Hodges's (Jour. Amer. Med. Assoc., Apr. 14, 1923) 9 cases, subdiaphragmatic abscess followed an appendectomy. Four cases died. Stress is laid on the value of X-ray examination in the diagnosis, and on the influence of early diagnosis on the outcome. The Xray evidences consist of elevation of the diaphragm, accentuation of its dome and limitation of its excursions. There may also be visible a collection of gas beneath it. The procedure almost invariably gives definite information, and promiscuous needling for diagnosis is never indicated.

L. Nather and E. W. A. Ochsner (Surg., Gyn. and Obst., Nov., 1923) maintain, on the other hand, that for the early diagnosis, accurate *clinical* 

observation is far more important than the X-ray, which gave repeatedly negative results in 1 of their cases. In the few cases in which a diagnosis cannot be reached clinically, an exploratory aspiration, as advocated by Beck, is required. The needle is inserted in the posterior axillary line opposite the 1st lumbar spinous process and introduced upward and backward, in various directions, at an angle of less than 45°. In over 50 per cent. of the cases complicating appendicitis there are 2 co-existing abscesses, 1 above and 1 below the liver. For this reason the writers advocate a retroperitoneal operation. The incision is made posteriorly on the 12th rib to within 4 centimeters of the midline, the entire 12th rib is resected subperiosteally, the muscles freed from the renal fascia, blunt retractors inserted to elevate and protect the diaphragm and pleura, the abscess approached by blunt dissection, and the subhepatic and suprahepatic spaces explored with straight and curved needles, respectively. Large rubber tubes and iodoform gauze are used for drainage. A co-existing empyema can be drained through the same incision.

TUBERCULOUS (COLD).—Further experiences with various forms of injections for cold abscesses have in recent years been reported. L. Durante (Policlin., Apr. 15, 1923) records 540 such lesions in which injections of hypertonic salt solutions were used to stimulate osmosis in the abscess cavities, with gratifying results. The first 3 injections consisted of a 2.5 per cent. solution of calcium chloride, and later ones, of sodium chloride and magnesium chloride solutions, in succession, of like con-

centration. Sometimes a few drops of formaldehyde solution were added. Recovery often set in with the first injection, particularly in abscesses of the *ribs*. No curettage or other operative work were employed. Gravity abscesses from extensive *vertebral caries* were the slowest to heal, averaging 6 months. The saline injections were generally given at intervals of 4 days.

Injections of codliver oil containing 10 per cent. of iodoform were used by Huët (Nederl. Tijdschr. v. Geneesk., June 21, 1924) in 22 cases with sinuses, all but 6 of which were improved. Of 9 old abscess cases about half rapidly healed and all were improved. Andrae and Van Brero (ibid., July 26, 1924) injected a 20 per cent. suspension of bismuth subcarbonate in neutral, sterile codliver oil in 31 cases, with cure or improvement definitely following in 23. Where the mixture failed to give prompt results or was deemed unavailable on account of the possibility of retention or because an abscess was merely threatening and not actually present, a suspension of iodoform in codliver oil was substituted.

Strong Lugol's solution in amounts ranging from 1 to 100 c.c. (16 minims to  $3\frac{1}{3}$  ounces) was injected by S. Laskownicki (Polska gaz. lek., ii, 275, 1923) at intervals of 5 to 7 days in 23 cases of cold abscesses and cervical nodes. It acts more strongly and rapidly than iodoform-glycerin, producing marked hyperemia of the abscess walls, attracting leukocytes, promoting proliferation of connective tissue and causing the abscess cavity to shrink very quickly. Of the 23 cases in which this procedure was followed, 19 were cured in 2 weeks to 3 months.

R. Purves and E. J. Bilcliffe (Brit. Med. Jour., May 24, 1924), after evacuating the abscess, inflate it with oxygen gas filtered through sterile cotton. The puncture is then closed with 1 or 2 Michel's clamps. Out of 21 cases, 10 recovered and 2 more were improved.

Radically different from the above procedures is a form of radical cure for tuberculous abscesses devised by Schwers (Bull. de l'Acad. Roy. de Méd., Apr. 26, 1924), in which, through a small incision, a curettage of the abscess is carried out with mechanical protection such as to exclude the outside air and secondary infection, thus transforming the lesion into an internal wound capable of healing by first intention. A small aseptic dressing completes the procedure. From his results in treating almost 500 abscesses in 150 different subjects, all the recent cases healing by first intention, the writer is led to assert that the procedure excells all others. Follow-up studies over several years proved the permanency of its results.

ACETANILIDE.—Attention is directed by S. Harnsberger (Amer. Med., May, 1924) to the utility of acetanilide, employed locally, in ulcerations and other inflammatory conditions of the tonsils, fauces and pharynx, irrespective of the type of infection present. The patient is required to hold his breath, the tongue is depressed, and a small quantity of the powdered drug, blown onto the affected surfaces through a tube. [In using this measure the toxicity of too generous amounts of the drug should be borne in mind.—Ed.]

## ACETONE.—ACETONEMIA.—

A number of studies relative to the presence and amount of acetone in the blood under varying conditions have recently been contributed. The term *ketosis* has come into more wide-

spread use to designate a condition featured by an accumulation of ketone bodies—of which acetone is one—in the system.

As stated by P. A. Shaffer (Med., Nov., 1923), only traces of acetone bodies are excreted by normal subjects that are normally fed. The factor responsible for ketosis is the absence of carbohydrate from the food or, as in the diabetic subject, from his metabolism. The oxidation of glucose in the body in some manner prevents ketosis, i.e., is antiketogenic. Other antiketogenic substances are glycerol and those amino-acids which, in diabetics, are converted into glucose. The amount of food taken has only a minor influence on the liability to ketosis, the main need being that the ketogenic food substances, vis., the fatty acids and certain of the amino-acids, be adequately counterbalanced by antiketogenic carbohydrate and glucose-forming substances. If the latter are not provided, oxidation of the ketogenic substances will stop while they are in the stage of aceto-acetic (diacetic) acid.

In *children*, acetonemia may occur as a symptom under a variety of different circumstances. F. J. Poynton (Lancet, May 24, 1924), emphasizing this fact, warns against a simple diagnosis of acetonemia in young children with a history of abdominal pain and partial constipation, even though much acetone be present and the abdomen apparently normal. A volvulus of the small intestine may be present under these conditions. Acetonemia is not merely an important danger signal in diabetes, but may frequently be observed as a transient state, perhaps with drowsiness and muscular weakness, in some illness without appreciably altering the prognosis of the latter. Again, it may be the prominent feature in a recurrent illness occasionally resulting in death.

According to O. W. Roberts (ibid., Jan. 19, 1924), ketosis is a common condition in the patients seen in casualty wards. Out of 393 such cases, 43 per cent. had acetone or diacetic acid in the urine; among patients under 10 years of age the ratio was even 66 per cent. Analyzing the incidence further, he concludes that cases of trauma, especially head injuries; of acute irritation of the intestinal or respiratory mucosa, and of acute suppuration may be complicated by a severe acute ketosis which may aggravate and mask the symptoms of the primary condition. The central nervous system, with no inherent protection against ketosis, suffers most, as evidenced by drowsiness, irritability and headache. Severe vomiting may follow and recovery be impeded. Alkalies and aperients constitute the treatment. The writer also advocates the prophylactic administration of alkalies to children suffering from acute trauma or inflammatory states.

ACETONURIA.—In a study of acetone excretion in fasting newborn infants, B. Schick and R. Wagner (Zeit. f. Kinderheilk., Mar. 7, 1924) obtained evidence that at birth there is present in the child's system a small reserve of carbohydrate which is used up in 3 days if no nourishment is taken. In about 50 hours after birth, acetonuria appears in the unfed infant, and at 72 hours it is very pronounced. Administration of a small quantity of sugar is sufficient to prevent the formation of the ace-

tone bodies. Omission of feeding of newborn infants is disapproved of by the writers, on account of the resulting depletion of carbohydrate reserves.

A similar depletion of carbohydrates, with appearance of acetone in the urine, has been observed by Pritzi and Lichtmann (Wien. klin. Woch., Aug. 23, 1923) in pregnancy upon institution of a carbohydrate-free diet. This is ascribed by Schick and Wagner (loc. cit.) to the fact that great demands are already normally made on the carbohydrate reserves in pregnancy, so that only a slight additional depletion is sufficient to bring on acetonuria.

According to R. S. Hubbard and C. W. Webb (Clifton Med. Bull., ix, 85, 1923; Surg., Gyn. and Obst., Nov., 1923), thyroidectomy has a specific effect in the causation of acetonuria. They believe that increased thyroid secretion due to handling of the parts during the operation may be the cause of the acetonuria through an increase in the metabolic rate, thus exhausting the sugar reserve-often already low in these cases—and producing an acidosis. The degree of acetonuria was found to vary directly with the metabolic rate. Ingestion of carbohydrates or the giving of glucose by the rectum tended to reduce the acetonuria.

ACETONE TESTS.—Bigwood and Ladd (Jour. of Biol. Chem., Nov., 1923) point out that in the sodium nitroprusside test, sodium chloride or other electrolytes in the urine intensify the color of the ring produced in the test, and that quantitatively, as routinely performed, this and the ferric chloride test for diacetic acid serve only as crudest approximations in indicating the amounts of acetone or diacetic acid present. Sodium nitroprusside reacts with both substances, whereas ferric chloride responds only to diacetic acid.

ACETYLENE.-Acetylene has appeared to be a desirable anesthetic, resembling nitrous oxide in its action, to C. J. Gauss and H. Wieland (Berlin. klin. Woch., Jan. 15 and 22, 1923), who found that respiration and circulation are not interfered with by it and that recovery from the anesthesia is rapid. C. H. S. Horwitz (Lancet, Mar. 24, 1923) asserts that in K. Gauss's clinic no other anesthetic is employed and that 515 cases have been thus anesthetized without catastrophes. Under a mixture of acetylene, 40 parts, and oxygen, 60 parts, with oil of pine added to mask the objectionable odor, pain insensibility is induced in less than 5 minutes. Induction is rapid, without excitement; the patients do not change color, and there is little or no after-vomiting. The patient's temperature usually drops one degree below normal. Relaxation is sufficient for major operations, though less than with chloroform. Attempts at using acetylene in childbirth showed that it diminished uterine contractions.

According to R. Schoen (Münch. med. Woch., July 4, 1924), acetylene is effective in concentrations ranging from 20 to 50 per cent. by volume. His studies indicated that oxidation processes are reduced by this anesthetic. From the start of the anesthesia acidosis was found to exist.

In the United States much more attention has been paid to ethylene as an anesthetic than to acetylene.

ACETYLSALICYLIC ACID (ASPIRIN).—PHYSIOLOGIC AC-

TION.-From experiments on the frog's heart, in situ or isolated, as well as bloodpressure studies in cats, W. L. Mendenhall and H. F. Camp (Boston Med. and Surg. Jour., Feb. 21, 1924) maintain that acetylsalicylic acid is not depressant to the heart or circulation in ordinary nor in very large doses, but instead has a direct stimulant effect on the heart-muscle. In the cat experiments, in which the drug was injected intravenously in doses comparable to or larger than those used in man, an increased heart-rate and blood-pressure uniformly followed. They believe this observation accounts for the rarity of reported fatalities from this widely used drug. The occasional strong or unusual heart beats in patients taking aspirin may be due to the increased irritability of the heartmuscle induced by the drug.

ACHONDROPLASIA.—According to P. Lewin and E. L. Jenkinson (Amer. Jour. of Roentgenol., Feb., 1924), the most likely view of the origin of this condition is that of Jansen, who ascribes it to a small amnion, increasing the normal embryonic infolding and hydrostatic pressure during the 5th or 6th week of fetal life, and thereby causing a feebleness of growth of the cartilage cells. As regards treatment, the writers lay stress on orthopedic treatment-correction and retention-in cases in which deformities and contractures are present. Such treatment should be kept up for years, until all affected tissues have assumed their final form. By straightening the legs and other orthopedic procedures, the height of a 13-year achondroplasic boy was increased by  $3\frac{1}{2}$  inches in 5 weeks.

## ACHYLIA GASTRICA.— SYMPTOMS AND DIAGNOSIS.—

C. Bonorino Udaondo (Arch. des mal. de l'app. digest., May, 1923) recognizes an organic and a functional type of achylia, and subdivides the latter type into constitutional and acquired forms. In distinguishing the functional from the organic type, the gastritis causing the latter type is excluded by the absence of mucus from the gastric contents and studies of the gastric cytology (gastric eosinophilia being suggestive of organic achylia) and of gastric evacuation (retarded in organic achylia) by means of the X-ray. The history is important for the exclusion of the

causes of gastritis and study of the evolution of the symptoms. functional type of achylia is often accompanied by congenital anomalies. such as dental deficiencies, geographic tongue, low blood-pressure, bradycardia, chronic constipation, hernia, and such urinary disturbances as oxaluria, phosphaturia and sometimes albuminuria. Intestinal function is normal, in contrast to the gastrogenous diarrhea frequent in organic achylia. Out of 19 functional cases, 11 were constitutional and 8 acquired. General asthenia was present in all but 1 of the constitutional cases, but gastric symptoms only in 2. Two were in cases of acute rheumatism. Of the 8 acquired cases, 4 yielded gastric splashing during digestion; 3 were cases of tabetic gastric crises, and in these the gastric secretion was normal during the intervals between attacks. Other possible causes of transient achylia are exhaustion and vagotonic depression.

The symptoms observed by B. W. Fontaine (So. Med. Jour., July, 1924) in 100 cases comprised loss of weight and strength, pain and tenderness, abdominal cramps and discomfort, and low blood-pressure. In 21 cases, however, there were no gastro-intestinal symptoms whatever. Hence the diagnostic importance of an actual analysis of the gastric contents after a test-meal, which is advocated by the writer as a routine part of every general examination. For confirmation of an absolute achylia a fractional analysis by the Rehfuss method is always required, and thereafter, at regular intervals, further analyses should be made.

TREATMENT.—In the treatment of functional achylia, Udaondo (loc.

cit.) finds papain more active than pepsin or other digestants, by reason of the alkaline condition in the stomach. Stimulants to the gastric glands are used only in cases with dyspeptic or intestinal disturbances. In general, tonic and supportive measures are employed.

According to D. Vanderhoof (Arch. of Int. Med., Dec., 1923), achylia gastrica is nearly always associated with pernicious anemia. Combined sclerosis of the spinal cord may coexist, or be present in the absence of pernicious anemia, as in the 7 cases which he describes. In either event he regards the achylia as primary to the other conditions, operating through absence of the defensive properties of the hydrochloric acid against infection, with resulting chronic intestinal toxemia and injury to the bonemarrow or spinal cord. Good therapeutic results may be obtained if the achylia is detected early and appropriately treated. Indeed, the giving of hydrochloric acid in all cases of achylia is recommended as a prophylactic against the blood and cord disturbances. One teaspoonful of the diluted acid may be prescribed with the meals, in buttermilk, and if need be, another ½ teaspoonful ½ hour after meals may be given. In addition, foci of infection should be removed. In the author's cases 1 teaspoonful of dilute hydrochloric acid was given with each meal, mixed with 6 or 8 ounces (180 to 240 c.c.) of water, lemonade, orangeade, iced tea or buttermilk. The foci of infection dealt with were apical abscesses, pyorrhea, infected tonsils and prostatitis. Out of the 7 cases, 1 became entirely well, 2 were apparently cured and 1 was improved.

ACIDOSIS.—The original meaning of the word "acidosis" when introduced by Naunyn was that of an intoxication due mainly to beta-oxybutyric acid, which Kunz and Minkowski had recently discovered in the blood and urine of diabetic cases, and in a minor degree to the chemically allied substances, aceto-acetic (diacetic) acid and acetone. As stated by M.-P. Weil (Monde méd., May 15, 1924), however, this was far too narrow a conception of acidosis, which may occur in the absence of acetone bodies and be attended with the presence in the tissue fluids of an excess of phosphoric, carbonic or lactic acids or even, perhaps, of sulphuric, hydrochloric, acetic and other acids. Conversely, there are diabetics whose urine is rich in ketone bodies without their being in a condition of acidosis. It is thus necessary to avoid confusing ketosis due to the ketone bodies, with acidosis, implying a condition attended with lowered alkalinity of the blood or acidemia.

etriology.—The following forms of acidosis may now be set apart, according to Weil: (1) Acidosis from fasting, due more particularly to withdrawal of carbohydrates. On the 2d day acetone and diacetic acid appear in the urine, and on the 3d day, beta-oxybutyric acid. Ingestion of 30 to 60 grams of carbohydrates, acting as antiketogenics, reduces the acetone in the urine to the normal trace. An allied condition is the acidosis of scurvy, resulting from an exclusive diet of dried, salt meat.

(2) Diabetic acidosis, believed by some to be related to the preceding variety, but which is not always, though usually, likewise a ketosis. The acidosis, according to various

observers, may develop at the expense of either the carbohydrates, fats or proteins.

- (3) Acidosis from impaired nutrition, due to inanition, some gastric or intestinal disease, or other debilitating disorders such as cancer, mental anorexia, neurasthenia with inadequate food intake, hyperemesis gravidarum, grave hemorrhagic disorders or exophthalmic goiter, acute delirium or melancholia.
- (4) Hepatic acidosis, which may or may not be a ketosis, and occurs in liver diseases, pregnancy, the cyclic vomiting of children, and acute abdominal infections, especially appendicitis.
- (5) Renal acidosis, often observed in the later stages of acute or chronic nephritis, but not necessarily accompanied by azotemia or chloridemia. It is frequently fatal, and is not a ketosis, but is generally attended with a pronounced increase in the phosphoric acid of the blood plasma. It may be due to deficient renal elimination, though Bigwood ascribes it to impaired formation of ammonia by the kidneys.
- (6) Mixed forms, such as the acidosis of febrile diseases, due to abnormal tissue consumption and to hepatic and possibly renal insufficiency; post-operative acidosis, brought on by pre-operative fasting, fatigue, fear, restlessness, sleeplessness, shock and toxic effects of the anesthetic on the liver and kidneys, and the acidosis of war wounds, resulting from shock, hemorrhage reducing the alkali reserve, injury to muscle-tissue, cellular autodigestion, circulatory disturbances increasing the lactic acid of muscular origin through reduced oxygen supply, external heat promoting re-

turn of acid blood from the veins, germs such as *B. welchii* (forming acid cultures in serum), and hepatic lesions.

In a case of grave acute acetonemia in a boy of 7 years examined postmortem by A. Furno (Riv. di clin. ped., May, 1923), death had occurred 12 hours after the beginning of convulsions and coma, and the child had been healthy except for a week of vomiting 8 months before. Latent hyperthyroidism is believed to have been the cause of the acetonemia, the thyroid gland being large and suggesting exophthalmic goiter histologically. Marked, presumably secondary, involvement of the liver and pancreas was also found. In 2 other cases the condition had been diagnosed as tuberculous meningitis, but recovery occurred in a week under 15 to 20 Gm. (1/2 to 3/3 ounce) of sodium lactate daily, taken in divided amounts. N. Burgess and A. A. Osman (Feb. 9, 1924) report experiences indicating that in acute rickets there is a severe acidosis in which the acetone bodies play no part.

Regarding acidosis in anesthesia, R. L. Stehle and W. Bourne (Jour. of Biol. Chem., May, 1924) have reported investigations indicating that phosphoric acid leaves the muscles during ether anesthesia and remains in the liver until the kidney function upon recovery, after which it is redistributed and in part excreted. The low alkali reserve and increased acidity of the blood in ether anesthesia may be due to this discharge of phosphoric acid from the muscles.

DIAGNOSIS.—Clinically, acidosis is often a latent condition; in other instances it gives rise to symptoms which have led Labbé, e.g., to recognize somnolent, comatose, delirious, dyspneic and emetic types of acidosis and Netter, in addition, a meningitic type. In animal experiments, furthermore, acute acidosis has been found capable of producing sudden

death, without any premonitory symptoms.

In incipient, symptomless, "compensated" acidosis, as noted by S. A. White (Internat. Clin., iv, 48, 1923), the condition is detected by determination of the alkali reserve of the blood, which reveals a beginning depletion of available alkali; analysis of the alveolar air may show a disturbance of carbon dioxide tension, which is first increased, then decreased. "Uncompensated" acidosis begins when, the alkali being gradually used up to neutralize acids, the supply of bicarbonate begins to fail, and an actual change in the reaction of the blood sets in. At this point symptoms appear, and the carbon dioxide tension sinks very low. In diagnosis, determination of the alkali reserve is the most direct and reliable procedure. The indirect methodscarbon dioxide tension and alkali tolerance,-however, also yield useful inferential information.

Stress has been laid by DeW. H. Sherman and H. H. Lohnes (Arch. of Ped., Nov., 1923) on infections and intoxications as causes of acidosis in children. The infection may be expressed merely in a slight reddening of the nasopharynx, sensitiveness of some of the cervical glands, or hyperemia of the ear-drum. Adenoidectomy and sometimes tonsillectomy are indicated in such cases. Eyestrain may cause acidosis by interfering with digestion and leading to absorption of toxic products; refraction may be abruptly curative in such cases. Enteroptosis or an elongated, tortuous sigmoid constitute very common causes of "bilious attacks" with acidosis symptoms in children 4 to 8 years of age; relief often follows correction of a malposition of the body, with or without abdominal support. At times toxic foreign proteins are a cause of acidosis symptoms.

TREATMENT.—The treatment of acidosis in infants and children should be directed, according to J. H. Hess (Northwest Med., Nov., 1923), to the prevention of further production of acids, replenishing the alkali reserve, elimination of the acids and their salts, and the treatment of the underlying factors, whether these be acute infections, starvation or organic diseases. Large amounts of water should be given by mouth; if it is not retained, subcutaneous or intraperitoneal use of normal saline or Ringer's solution is advised, the latter as often as every 6 hours, if necessary, during the early treatment. In non-diabetic acetone body acidosis, glucose should always be given, either by mouth, rectum or intravenously. By the mouth, a 5 to 10 per cent. solution may be given every 2 to 4 hours, in quantities varying according to age and gastrointestinal tolerance. By rectum, a 5 per cent. solution may be given to the amount of 60 to 120 c.c. (2 to 4 ounces) every 3 or 4 hours; in young infants and older children who are not too restless the drip method may be used. Intravenously, 5 or 10 per cent. glucose in Ringer's or saline solution may be given in amounts of 60 to 300 c.c. (2 to 10 ounces), repeated as indicated. Glucose rather than bicarbonate is the prime agent for non-diabetic ketosis or lactic acid acidosis. When the alveolar carbon dioxide tension is above 30, recovery is usually spontaneous and bicarbonate unnecessary. If it is given, sodium bicarbonate should be used

by the mouth, 1 to 2 Gm. (15 to 30 grains) in water at 4-hour intervals, or intravenously, in a 2 per cent. solution in the quantities already mentioned for glucose.

As soon as the stomach is found able to retain inert fluids-usually not over 6 to 12 hours-carbohydrates should be given by the mouth. Thick cereal pastes, to which cane sugar or maltose-dextrose compounds have been added, are usually best retained, and may be given in small quantities at 2-hour intervals, or at longer intervals with corn or maple syrup or honey in teaspoonful or larger amounts. Malted milk is often well taken and candy, such as milk chocolate or caramels, is useful. Fruit juices sweetened, especially orange juice, should be given in small quantities. If orange juice is retained, larger quantities diluted with sweetened water should be given and continued. Skim milk, or better. skim buttermilk, can usually be given by the third day. Carbohydrates should be pushed preventively in acute infections.

Gastrointestinal symptoms may call for milk of magnesia or other mild saline laxative, enemas, and gastric lavage with a weak sodium bicarbonate or citrate solution. Small doses of phenol at 2-hour intervals for 3 or 4 doses, together with camphorated opium tincture, are indicated for vomiting and restlessness. In a few extreme cases of "epidemic" acidosis, blood transfusion yielded striking results.

W. P. Cornell (Arch. of Ped., Feb., 1924) refers to hyperpnea and bright red lips as significant of acidosis and divides the cases, with their treatment, into 5 distinct types: (1) *Urinary acidosis:* Water to be given freely and

patient watched for sighing and airhunger. (2) Acidosis with vomiting, but without fever or leukocytosis: Sylvester orange-juice treatment: Strained, ice-cold orange-juice in teaspoonful doses every 5 minutes until vomiting stops; then, after ½ hour, 2 teaspoonfuls every 5 minutes until vomiting has stopped for ½ hour; then 4 teaspoonfuls, and so on until 1 ounce of juice is retained each 5 minutes for 1/2 hour. The juice of canned pineapple may be substituted for orange juice in the same dosage, and either juice may be further sweetened with honey, dextrose, or even cane sugar or corn syrup. In desperate cases, sodium bicarbonate intravenously, by enema or intraperitoneally in 5 per cent. solution, or dextrose intravenously or by enema in 5 to 7 per cent. solution. (3) Acidosis with vomiting, fever and leukocytosis: Same treatment, together with discovery and prompt treatment of the focus of infection. (4) Diarrheal acidosis: Both salts and water to be supplied. Enough carbohydrate must be available for normal fat combustion. In severe vomiting, precluding sufficient ingestion of carbohydrate, insulin, properly used, should rapidly check the acetonuria and nausea, thus permitting of food retention; its use is unsafe, however, without blood sugar estimations. (5) Acidosis with profound toxemia: Rather hopeless; anything and everything should be tried.

Acidosis in Chronic Appendicitis.—Acidosis in acute abdominal disorders has already been described by several observers. S. McGuire (Va. Med. Mthly., May, 1924), after referring to the acidosis induced by such foci of infection as diseased tonsils, abscessed teeth, discharging ears, and suppurative processes in glands, bones or joints, alludes to 16 personal cases of appendectomy for recurring attacks of acidosis in children, with uniformly successful results. In such cases, when hygienic

treatment and diet have failed, if no other focus of infection is discoverable, and if X-ray examination shows the appendix to be abnormal, appendectomy may be confidently recommended. The acceptable X-ray evidences of chronic appendicitis are adhesions about the appendix, concretion or constant constrictions, delayed emptying, and tenderness upon displacement of the appendix under fluoroscopy.

Postoperative Acidosis.—This condition was successfully treated with insulin in 3 non-diabetic cases by W. Thalhimer (Jour. Amer. Med. Assoc.; Aug. 4, 1923). Ketosis being due to insufficient combustion of the carbohydrates required to burn the fat completely, he thinks that in postoperative acidosis a slight abnormality of carbohydrate metabolism may be at the bottom of the ketosis and that a vicious cycle supervenes (vomiting causing starvation, and the lack of nourishment further aggravating the ketosis), causing the symptom-complex to persist. Either giving glucose or controlling the vomiting will break this cycle; but insulin is valuable in that it increases the rapidity of utilization of glucose in the body (both in normal and diabetic subjects), and will thus clear up ketosis and vomiting more rapidly than glucose alone. In a woman of 35 years who began to vomit 24 hours after a supravaginal hysterectomy, gastric lavage and glucose intravenously failed to relieve the symptoms and prevent acetonuria, but upon giving 10 units of insulin, in 3 hours the acetone was reduced to a trace, the symptoms ceased, and convalescence followed. At least 2 Gm. of glucose should be given for every unit of insulin injected, and the patients carefully watched. Favorable results with insulin were also obtained in a case of starvation acidosis due to pyloric obstruction, and trial of insulin with glucose in vomiting of pregnancy and cyclic vomiting in children is suggested.

Acidosis Following Trauma.—In the case of an 11 year old boy with fracture of the bones of the left leg and contusions of the chest and abdomen as a result of being struck by a truck, reported by G. Ginsberg (Jour. Amer. Med. Assoc., May 10, 1924), the symptoms on the next day were vomiting, restlessness, dyspnea and pains in the neck. Later, the patient appeared like one in shock; urinalysis showed 0.5 per cent. of glucose, acetone 4 plus, and diacetic acid. Insulin, 25 units of H-20, was given intravenously together with 200 c.c. (6\%) ounces) of 10 per cent. glucose solution. This was followed by a hot coffee enema and a rectal drip of 5 per cent. sodium bicarbonate. The patient took very slowly about 4 ounces (120 c.c.) of orange juice by mouth. Improvement followed, and under further treatment of the same sort, recovery. The history, as well as blood tests during and after the illness, failed to show a diabetic condition.

ACIDOSIS TESTS.—Until recent years, approved tests for acidosis, such as the tests for acetone bodies in the urine, and the ammonia nitrogen-total nitrogen and amino nitrogen-total nitrogen ratios in the urine, were, as stated by Weil (loc. cit.), suitable only for the detection of ketosis. The reaction of the urine itself is no criterion, as acidosis may be associated with normal urinary acidity, and increased urinary acidity may be an expression of conditions other than acidosis. The

presence of acetone bodies in the blood or cerebrospinal fluid is a manifestation of but one form of acidosis. Of the really reliable tests for acidosis, the indirect procedures include determination of the urinary ammonia and of the carbon dioxide tension in the blood or the expired air. The direct procedures are based on determination of the hydrogen ion concentration (pH) of the blood itself. Of these, Weil prefers the colorimetric method of Sörensen, on account of its speed and simplicity. It is performed by the addition to a known quantity of blood of an isotonic solution of sodium chloride and phenol red. Under the influence of the blood plasma the mixture assumes a coloration which varies according to the reaction of the blood, and the exact significance of which is determined by comparison with standard tubes of known ionic acidity. The blood for the test is collected from a vein in a syringe, contact with the air being avoided and the blood not allowed to remain quiet, and is introduced, through a small rubber tube, to the bottom of a centrifuge tube, in contact with a little potassium oxalate and beneath a layer of liquid paraffin. The tube may be closed with a rubber stopper, but the test on the blood should be made as soon as possible. At the same time the alkali reserve of the blood should be determined [procedure described in the preceding Supplement].

ACNE.—ETIOLOGY.—Rather than as a "punishment for youthful indulgences," J. L. Webb (Ther. Gaz., Oct., 1924) regards the facial acne of adolescents as an evidence of underdevelopment, which will later disappear naturally regardless of the patient's habits or the form of treatment. It is specifically a disease of the immature hair follicles and newly active sebaceous glands, having as yet no duct through the epidermis. Pressure on the surrounding tissues results in lowered resistance and pustulation. There seems often to be deficient immunity to infective bacteria. Eventually, either a duct or outlet is formed or the infection destroys the papillæ, thus precluding further trouble therefrom.

In a case of acne of the face, back and neck in a boy of 15 years, reported by A. H. Hoge (Jour. Amer. Med. Assoc., Mar. 8, 1924), milk allergy was an obvious factor. condition has first been noticed in infancy when the child was put on cow's milk. At 12 years, it returned when he was compelled to drink milk on a camping trip in spite of his distaste for it. Treatment for 3 years had brought no relief, but during this period he had been forced to drink milk each day. When tested for food allergy he reacted strongly to milk and cheese. He was thereupon placed on a milk-free diet, not even eating bread that had milk in it. In 6 weeks there was much improvement, although no local or constitutional treatment had been given, and eventually the skin appeared healthy. Upon eating ice cream and milk chocolate, there was a temporary recurrence.

> According to A. Meska (Ceska Derm., iv, 131, 1923; Brit. Jour. of Derm., Nov., 1923), acne is a result of a lack of vitamin B in the system. Evidence offered in support of this view includes the frequent improvement of acne by administration of vitamin B, as in yeast; its occurrence in growing subjects, in the period of greatest need of vitamins; animal experiments showing the relation between vitamin starvation, the genital functions and skin disturbances; the flaring up of acne in the spring following a period of lessened vitamin supply in winter food; the fact that the favorite diet of acne patients is usually poor in vitamins (meat, fats, scanty vegetables), and the frequent dyspeptic disturbances throughout the alimentary tract.

TREATMENT.—A therapeutic indication in acne being to inhibit the overactivity of cells of the sebaceous glands and follicular openings, the X-ray seems a suitable measure. Howard Fox (Jour. Amer. Med. Assoc., Oct. 27, 1923), reporting favorable experiences with it in 191 cases, asserts his conclusion that, except in mild cases, nothing but time and the X-ray will effect a permanent cure. His technic consists in giving 1/4 of Remer and Witherbee's "skin unit" of unfiltered rays weekly for 12 to 20 treatments. A 2-ma, current is used, with a 6-inch spark-gap for 45 seconds and a distance of 8 inches from anode to skin. For the face, usually 3 exposures are given, 1 to the forehead and 1 each to the sides of the face and neck. With modern improved technic, unpleasant results from the treatment are practically eliminated. Great care must be taken to avoid an erythema. Out of the 191 cases, the eruption disappeared entirely in 111, had almost disappeared at the last visit in 47, and was considerably improved in 27; marked relapses occurred in 4 and complete failure in 2.

Regarding vaccine therapy, Fox alludes to the prevailing view that the "acne bacillus" is the cause of the comedo, while staphylococci are responsible for the pustulation; some doubt, however, that the acne bacillus is pathogenic. Although good results have been obtained with vaccines by a few investigators after patient efforts with special technic, in the hands of the majority, the results in general have been unsatisfactory. The weight of opinion is that mixed vaccines (of both acne bacillus and staphylococcus) are the

best. Stock and autogenous vaccines are considered of equal efficiency. The vaccines are of value only in selected cases, chiefly pustular, or as an adjuvant to the other measures. The resulting improvement is often temporary.

J. A. Scott (Brit. Med. Jour., Mar. 15, 1924) prescribes a cathartic of rhubarb and sulphur and 3 warm baths a week, each of 20 minutes' duration, in which are dissolved 15 to 30 Gm. (½ to 1 ounce) of zinc sulphate, according to tolerance of the skin. Night and morning, the following lotion is applied to the affected area:

```
R. Sulphuris
præcipi-
tati ... 0.5-1.25 Gm. (gr.viiss-xx);
Zinci oxidi 0.5 Gm. (gr. viiss);
Camphoræ
pulveris 1.33 Gm. (gr. xxj);
Tragacan-
thæ ... 0.125 Gm. (gr. ij);
Liquoris
calcis .. 240 Gm. (5viij).—M.
```

The amount of sulphur is increased according to skin tolerance; occasional intermissions may be required. Regarding the diet, the writer has not found dietary adjustments of great efficacy except in young girls taking candy to excess. In general, fruit and green vegetables are good, and an excess of carbohydrates is bad.

All cases show improper endocrin balance, according to Webb (loc. cit.). The girl patient should be given such doses of whole pituitary, whole ovary, thyroid and suprarenal substances as will lead to regular and painless menstruation. Her embarrassment and timidity should disappear. In conjunction with the endocrins, a small amount of iron or

arsenic suffices to correct the anemia and general symptoms. The boy patient is given such doses of anterior pituitary, thyroid, suprarenal and orchic substances as seem required to promote a proper endocrin ratio. Iron and arsenic are also given according to indications. The patient then ceases to blush so readily, is less easily confused, and becomes less self-conscious and bashful as the acne diminishes. If some papules are still appearing after 1 to 3 months of this treatment in conjunction with local measures, 1 to 3 X-ray applications (1/4 erythema dose) are made weekly.

> With regard to the dermatosis frequently known as oil acne, consisting of comedones and pea-sized papular lesions, with more or less intense itching, due to contact of cutting oils or lubricant compounds with the skin in industrial workers, McConnell (Publ. Health Rep., July 21, 1922) made the following recommendations to several managers of plants in which the disorder was prevalent: On entering the plant each workman is to wash his arms and hands thoroughly with warm water and a sawdust and liquid soap preparation. After drying with an individual towel, he is to apply either lanolin or lanolin and castor oil, rubbing it well into the skin. Before lunch he is to wash with warm water and soap, and on returning to work, repeat the morning schedule. At the end of the workday he is again to wash with warm water and soap. Under these regulations, properly enforced, the cases of oil acne were soon eliminated.

> Favorable results in 35 cases of acne vulgaris have been reported by J. L. Tenenbaum (Ther. Gaz., May, 1923) from protein therapy in the form of injections of aolan, introduced by Müller as a purified casein preparation in a toxin- and fat-free solution. In the majority of cases the preparation was given intramus-

cularly in the buttocks in doses of 5 to 10 c.c. (80 to 160 minims) in adults and 3 to 5 c.c. (48 to 80 minims) in children at 2 to 4-day intervals. Though local treatment was discarded, most cases showed decided improvement.

ACRIDINS.—Considerable attention has been paid of late to 1 of the acridin compounds, viz., acriflavin, which has come into rather widespread use as a surface antiseptic, and has also been tried by mouth and by intravenous injection. H. Spencer (Jour. of Lab. and Clin. Med., Feb., 1924), in laboratory studies on the compound, finds that in a concentration of 1:2000 or lower in saline solution it has no agglutinative action on human erythrocytes. In vitro, it dissolves such erythrocytes in concentrations exceeding 1:8000. In rabbits, injection of 0.1 Gm. per kilo. of body weight induces a considerable increase of the leukocytes and a slight but transitory reduction of the erythrocytes. Intravenous injections in rabbits were not found to increase the bactericidal action of the serum or afford protection against virulent pneumococci.

The drug seemed to be absorbed so rapidly by the tissues that an effective concentration in the blood could not be maintained.

G. Salwén (Svenska Laek., xx, 49, 1923; Surg., Gyn. and Obst., Jan., 1924), however, has reported 7 cases of septic conditions (septic pneumonia, gangrenous erysipelas, acute osteomyelitis, furuncles and abscesses) in which intravenous injections of 20 c.c. (5 fluidrams) of a 0.5 per cent. sterilized and filtered solution of trypaflavin (acriflavin) seemed to act favorably, the temperature in each case receding almost at once and recovery following. The injections were given at the most twice on 2 succeeding days.

According to E. Davis (Jour. of Urol., Jan., 1924), many cases of acute urinary infections show prompt improvement upon internal administration of acriflavin. Experimentally, 0.1 Gm. (1½ grains) of acriflavin in normal subjects was found to render the urine an unfit culture medium for the colon bacillus and staphylococcus, provided the urine was alkaline. Clinically, each patient

was first given 2 or 3 drams (30 to 45 grains) of sodium bicarbonate daily to alkalinize the urine; after several days 0.1 Gm. of acriflavin was given in a capsule twice daily, and the bicarbonate continued. Acute cystitis and acute non-surgical kidney infections, with bacteriuria, showed prompt improvement. Chronic cystitis and pyelonephritis were improved only in 60 per cent. of cases. In acute posterior gonorrheal urethritis it aids in lessening the duration and severity of the acute symptoms.

Before using the drug, mechanical predisposing factors, general infections and chronic focal infections should first be dealt with. In 5 per cent. of the cases treated, vomiting and diarrhea necessitated its discontinuance.

Regarding surface disinfection with the acridins, Brunner and von Gonzenbach (Beitr. z. klin. Chir., No. 2, 225, 1923) found trypaflavin (acriflavin) as well as rivanol effective in 0.5 to 1 per cent. solutions against soil anaërobes. Streptococci, the diphtheria bacillus and staphylococci are particularly vulnerable to them. In vitro their action is but slightly lessened by the presence of blood serum, though in pus it is interfered with. Either substance may be used in solution or powder form; rivanol has the lower toxicity of the two. In powder form they protect against infection by soil bacteria, but for aseptic operative wounds they are unsuitable as their action is too selective. In established streptococcic or diphtheritic wound infection they may overcome the infection; in other infections they are not superior to other antiseptics.

In eye diseases the use of acriflavin is lauded by Ganguli (Indian Med. Gaz., Sept., 1922), who finds its curative and prophylactic value comparable to that of the silver remedies. It causes no local discomfort or irritation, and is useful in various kinds of mucopurulent conjunctivitis and ulcerative keratitis due to cocci or the Koch-Weeks bacillus. In ulcerative stomatitis, tonsillitis and pharyngitis, application of a 1:1000 acriflavin solution produces a yellow film over ulcerations and allays pain and inflammation. When the slough is cast off, healthy granulation tissue is found beneath.

ACROCYANOSIS.—In a case reported by E. Ledoux (Lyon chir., Mar.-Apr., 1924), itching, cyanosis, edema and stiffness of the right hand were complained of. The oscillometric tracing showed reduced pulsations on that side but the hand was warmer than its fellow. At operation the brachial artery was found contracted and the veins dilated. Peri-brachial sympathectomy was performed, with resulting marked and lasting improvement.

ACRODYNIA.—Six cases of this condition have been reported by S. D. Giffen (Jour. Mich. State Med. Soc., Jan., 1924). All started with or were soon followed by inflammation of the upper respiratory tract. The patients ranged in age from 103/4 months to 2 years. Stress is laid on the interval of from a few weeks to 5 months which elapses between the onset of fretfulness and the involvement of the hands and feet, loss of strength, sweats, scratching and photophobia. The disorder is distinguished from pellagra by the gradual transition from affected to healthy skin, the more marked lesions on the palms and soles, absence of scaliness on the back of the neck, the occasional occurrence in breastfed infants, the absence of any common dietetic factor, the aggravation in cold weather without recurrence in recovered cases, and the prolonged duration of symptoms. The treatment comprises local applications for the skin irritation, removal of foci of infection, tonics, sedatives and hypnotics when indicated; sunlight, fresh air and a complete diet: forced feeding if required, and possibly vaccines prepared from material obtained by gland puncture. The duration of illness in the writer's cases was from 3½ to 8 months.

ACROMEGALY.—Recent contributions on this disease have been largely limited to reports of certain more or less atypical cases and, of certain chemical aspects of the disorder.

In a case reported by H. W. Long and J. W. Gray (Med. Jour. and Rec., Jan. 2, 1924), the patient, a man of 45 had had pain in the hands and feet for 4 months, and the extremities were enlarged, boggy and pigmented. Other features were tumors of the lungs on X-ray examination, together with cranial evidences of acromegaly, subnormal temperature several days before death, and progressive anemia. At autopsy, the sella turcica and pituitary were found of normal size. A tumor weighing 40 Gm. involved the left suprarenal, and the right suprarenal was replaced by a large hemorrhagic, degenerated adrenal tumor weighing 1000 Gm. The lower pulmonary lobes were extensively invaded by adrenal metastases. The bones and spleen showed typical acromegalic changes. The pituitary showed an overgrowth of the eosinophilic and chromophobic cells, with cords invading the pars nervosa. In conclusion, attention is called to the obvious relationship existing between the adrenal and pituitary disturbances in this case, though the exact and pathogenetic sequence is not clear.

S. J. Thannhauser and F. Curtius (Deutsch. Arch. f. klin. Med., Jan., 1924) studied the *protein metabolism* in an acromegalic by placing him on a nitrogen minimum and determining his uric acid and nitrogen excretion.

The conclusion reached was that there is increased metabolism of nuclear substance and of protein in acromegalics on a nitrogen minimum. After deep X-ray treatment of the head both the uric acid and nitrogen declined to normal. In a normal subject such irradiation had no effect on uric acid or nitrogen excretion.

A case of glycosuria in an acromegalic woman of 42 years, reported by A. W. M. Ellis (Lancet, June 14, 1924), showed the following points of interest: (1) Severe hyperglycemia, the blood sugar on admission being 0.43 per cent.; (2) successful accomplishment, after dieting, of a prolonged major operation (transfrontal hypophysectomy), with only transient postoperative glycosuria; (3) disappearance of the glycosuria and hyperglycemia, with absence of glycosuria 3 years after the operation; (4) histologic evidence suggesting the origin of the tumor in the pars intermedia; (5) the occurrence of a tumor (mixed neuroblastoma and embryonic neuroma) of the carotid body, which was removed about 2 years after the hypophysectomy. On the basis of recent experiments tending to show that pituitrin is directly antagonistic in action to insulin, the writer suggests that the glycosuria frequently observed in acromegaly is due to interference with the normal action of insulin from the pancreas on carbohydrate metabolism through increased activity of the hypophysis in this disease.

TREATMENT.—A detailed account of the results of prolonged organotherapeutic treatment in a case combining evidences of acromegaly with those of thyro-ovarian insufficiency is presented by J. Caumisson (Jour. de méd. de Bordeaux, June 25,

1923). The patient was a woman of Upon administration of 36 years. whole pituitary extract, 0.1 Gm. (1½ grains) twice a day, menstruation was restored after having been practically absent for 10 years. The drug caused severe headache, however, and the treatment was changed to 0.1 Gm. of pituitary and 0.05 Gm. (34 grain) of dried thyroid on alternate days. The facial appearance improved and somnolence and apathy passed off, but the headache continued, whereupon the pituitary was omitted and 0.05 Gm. of thyroid given daily. Hair began to reappear in the axillæ, dyspnea on exertion disappeared, and muscular strength increased. In cold weather, however, the hands were cold and numb on awakening, with impaired sensation, burning and cyanosis of the fingers and toes. The thyroid was increased to 0.1 Gm. daily, but the condition of the hands was not improved until adrenalin, 10 to 20 drops of 1:1000 solution daily, was added. The fingers were now reduced in thickness; the patient had lost 7 kilos. of body weight, and resumed her occupation Later, a plurias stenographer. glandular preparation was used for a Soon after it was stopped, alarming symptoms reappeared, but these were at once checked by resumption of thyroid medication, which was continued thereafter. treatment the patient's prognathism had been markedly reduced, the lower portion of the face become narrower, and the tongue thinner. Attention is directed to the sensitiveness of the case to changes in the opotherapeutic treatment and the need of continuing the latter indefinitely in this type of case.

I. H. Pardee (N. Y. Med. Jour., Apr. 4, 1923) refers to the advisability of administering pituitary substance in cases in which pituitary function is deficient, and adduces the rapid amelioration of pituitary headaches under such medication. There are certain pituitary tumors which do not respond to oral administration of pituitary. In these, hypodermic injections of pituitrin, 5 to 15 minims (0.3 to 1 c.c.) 3 times a week, are often of avail. In 1 acromegalic patient with an incurable, inoperable pituitary growth, relief-albeit temporary-was afforded only by intravenous injections of pituitrin in saline solution.

Discussing the X-ray treatment of acromegaly, M. Nemenow (Fort. a. d. Geb. d. Röntgenstr., Jan., 1924) lays stress on the coexistence of lowered function of the gonads, as well as of disturbance of the thyroid and thymus (usually hypofunction) in some cases, and on the need of combining X-ray treatment of such organs with that of the pituitary itself. In deficient internal secretion of the testes or ovaries moderate irradiation may be employed to stimulate such secretion. In a young woman with amenorrhea, increasing body weight, enlarging hands and feet, and a 50 per cent. lymphocytosis, irradiation of the pituitary, ovaries and thymus resulted in a radical improvement in various respects. In a case of typical acromegaly, X-ray and radium treatment of the pituitary as well as X-ray treatment of the ovaries were administered in 3 series, with gratifying ultimate results.

**ACTINOMYCOSIS.**—This form of infection, according to A. H. Sanford (Jour. Amer. Med. Assoc., Aug. 25, 1923), who collected 678 cases from the literature and by independ-

ent investigation, is widely distributed in the United States. It is especially prevalent in the upper Mississippi Valley and the northwest portion of the country. At the Mayo Clinic, 160 cases (135 from the U. S. and 25 from Canada) have been seen in the last 14 years. In Nebraska probably 2 per cent. of the total of cattle is infected. In the South, the heaviest infection is in Tennessee. The disease in man may be acute or chronic and may affect any part of the body. Out of the 678 cases, there were as many as 22 between the ages of 1 and 10 years and 71 between 10 and 20. Only 50 per cent. of the patients were really in contact with cattle or in predisposing occupations. Anyone who is careless about chewing straws, twigs, grasses or grains, or who neglects the care of his mouth and teeth, may be readily infected. Physicians should be alert in the diagnosis of the disease, which is very easily made by microscopic examination of the discharges.

Two of Wohl's (ibid.) cases gave a history of using straw as a toothpick, and the third, a mail carrier, remembered having his face scratched by tall weeds along his daily route about 2 weeks before the actinomycotic swelling began. One case showed that the characteristic "sulphur granules," which really more closely resemble fish eggs and are not always yellowish, are not uniformly present in the pus. The finding of mycelia in the pus and the tendency to advance through all tissues, with the formation of fistulous tracts, should suggest actinomycosis.

In a case recorded by E. Köster (Deut. Zeit. f. Chir., Aug., 1923) the ray fungus had made its entrance

through a persistent area of intertrigo below the umbilicus and produced a polypoid tumor of the bladder, with an adjacent abscess. The patient recovered under a scraping out of the abscess followed by potassium iodide, X-ray exposures of the bladder and heliotherapy.

Reporting 2 new cases of actinomycosis of the abdominal wall, H. Albert, J. B. Hardy and J. W. Harrison (Jour. Amer. Med. Assoc., Aug. 25, 1923) state that this lesion is probably always secondary to involvement of the gastro-intestinal canal, chiefly the appendix and cecum. The first symptoms may be those of abdominal wall abscess or acute appendicitis, or an indefinite abdominal The process extends by burrowing small channels 1 cm. in diameter in the subcutaneous, subperitoneal and intermuscular tissues. Actinomycotic granules should be looked for whenever an abdominal sinus persists in spite of free drainage. The pus should be diluted with water to look for light yellowish granules. The gauze drains should be washed and, if necessary, the sinus curetted. The treatment consists of establishing free drainage, irrigating the abscesses and sinuses with copper sulphate solutions, and giving large doses of potassium iodide by mouth.

In the case of a man aged 45 years who had been suffering for 8 months with cough and pains on the right side, with loss of weight and weakness, H. Besser (N. Y. Med. Jour., May 16, 1923) found clinical and physical features pointing to a frank, active tuberculosis, but the extensive involvement of the lungs, with an abscess of half dollar size on the right side of the chest above the nipple line and necrosis of the 9th and 10th ribs near their angles, led to a diagnosis

of actinomycosis. This was later confirmed by the appearance of actinomycotic abscesses on the chest and back.

TREATMENT.-From the Mayo Clinic, G. B. New and F. A. Figi (Surg., Gyn. and Obst., Nov., 1923) have reported 107 cases of actinomycosis of the head and neck, constituting 68.1 per cent. of a general series of 157 actinomycotic cases. They point out that the clinical picture of a rapidly growing malignant tumor may be very closely simulated by actinomycosis. A tumor or gland of the head or neck which is clinically malignant but does not prove so microscopically is usually actinomycotic. Early diagnosis is very important in obtaining good results in treatment. The iodides are almost The X-ray is used, but specific. McKenty believes it distinctly harmful. Radium has proven very beneficial to break down granulomatous masses and clear up induration. The procedure found best by the writers is to open up widely all pockets and pack them with iodoform gauze so that the entire area of the pocket is exposed to the air. The pockets are dressed daily, using iodoform gauze and swabbing the wound with iodine. Radium treatment is used in all cases and is generally repeated every 3 or 4 weeks. If the mass is hard and indurated, with no fluctuant areas or sinuses, radium is applied with 2 mm. of lead screening and an inch of wood distance, using 3000 to 6000 millicurie-hours in this way. This usually makes it possible to drain the lesions, and also seems to block lymphatic drainage. Under such treatment very few cases develop extension to the chest. Potassium

iodide in saturated solution is given in an initial dosage of 10 drops 3 times a day, increased 1 or 2 drops a dose until 200 drops 3 times a day are being taken. If iodism is noticed, the drug is stopped for a day or two, then resumed at the same dose. After reaching 200 drops t.i.d., the patient intermits for a few days or a week, then starts in again at 10 drops. By this method practically all cases were cleared up except the advanced ones in which, owing to proximity to the skull or chest, the infection extended to the meninges or thorax. The mortality in the series was 8.2 per cent.

> In a case reported by A. D. Bigland and F. C. H. Sergeant (Brit. Med. Jour., July 14, 1923) there was a history of recent lobar pneumonia. The lower portion of the left chest proved opaque to the X-rays. The ray fungus was found in fluid from the right pleura and Staphylococcus aureus in fluid from the pericardium. The patient remained in a critical state for a time. The pleural and pericardial cavities were irrigated twice daily with collosol iodine solutions, and in addition, collosol iodine was given intravenously and large doses of iodide by the mouth. No iodism developed, and the case recovered.

> M. G. Wohl (loc. cit.) states that in his experience surgical intervention, especially curettage, has aggravated the lesions; they readily yield, however, to potassium iodide internally, compound iodine solution, copper sulphate solution, and the X-rays locally.

Where there is bone involvement the affected area should, as advised by A. F. Tyler (Urol. and Cut. Rev., May, 1924), be thoroughly excised by an oral surgeon. To soften the indurated area, the X-rays should be used thoroughly in a dosage sufficient to cause epilation, this to be repeated as often as the skin will stand it. Softened nodules are to be incised, their con-

tents pressed out, and the cavities swabbed with tincture of iodine.

ACUTE RHINITIS.—Existing information on the etiology, pathogenesis and curative treatment of the common cold is most unsatisfactory, in spite of the outstanding frequency of the disorder. Recent contributions have done little to bring order out of the chaos. According to E. O. Jordan, J. F. Norton and W. B. Sharp (Jour. of Inf. Dis., Nov., 1923), no one organism or group of organisms has been shown to predominate during colds. The question of a specific infectious virus is, therefore, still open. Of over 2000 university students from whom data were gathered, 64 per cent, believed their colds were induced by some strain on the heat-regulating mechanism of the body. Possible contact with others having colds was stated by 22 per cent. to have preceded their own "Resistance-building practices" apparently had little effect on the frequency of colds, nor did nose or throat operations result in a marked reduction. It was clear, however, that outside influences, particularly chilling of the body, may serve to induce a cold.

A study of colds in 500 infants between the ages of 1 month and 2 years by W. F. Winholt and E. O. Jordan (Jour. Amer. Med. Assoc., July 28, 1923) revealed a relatively high proportion of colds in the respective families, particularly in the mother. The incubation period seemed to be very short, nearly all the babies' colds contracted within the family showing symptoms before the preceding patient's cold had disappeared. Coincident ailments indi-

cating lowered resistance, especially those of deranged metabolism, were much more common in the babies with colds than in 500 babies without colds.

P. K. Olitzky and J. E. McCartney (Jour. of Exp. Med., Oct., 1923) have been able to induce typical symptoms in healthy persons with a filtrable agent obtained from the nasopharyngeal washings of patients during the very early hours of the onset of a cold. Transmission failed, however, from cases in which the colds had resulted from exposure to the elements or chilling of the body and not from contact with other cases. On the other hand, R. C. Robertson and R. L. Groves (Jour. of Inf. Dis., Apr., 1924), in tests with filtered nasal secretions from 11 cases of acute coryza sprayed on the nasal mucosa of 100 volunteers, found no convincing evidence of a filtrable organism as the exciting factor. During the onset and early stages of acute coryza they found a marked diminution of the total bacterial flora of the nasal secretions, with an equally marked predominance of 1 of the normal inhabitants -usually Staphylococcus albus. During the purulent stage, a marked increase of all organisms over the normal flora was observed, although the predominance of 1 organism still remained. In the later stages there was a gradual return to the normal flora.

PROPHYLAXIS.—Although his results with respiratory vaccines have so far been inconclusive, D. F. Smiley (Jour. Amer. Med. Assoc., Feb. 16, 1924) believes prophylaxis along these lines offers some hope of success. Theoretically, the aim to prevent severity, prolongation and complication of colds—often caused by secondary bacterial invaders—is not impossible of attainment if the vaccines are deemed capable of combatting the secondary invaders and

if it is considered that the unknown primary virus itself is capable of running only a mild course.

An autogenous vaccine is deemed serviceable for immunization against colds by R. L. Cecil (Med. Clin. of No. Amer., July, 1924). Swabs from the nasal cavities and throat are washed off in a few drops of bloodbroth, which is then spread over blood-agar plates. The vaccine is prepared usually from 2 to 4 of the more important species of bacteria isolated, to a total concentration of 2 billion organisms to the cubic centimeter. After heating to 60° C. for an hour, 0.25 per cent. of tricresol is added. Weekly injections are given, starting with 0.1 c.c. and increasing by 0.1 c.c. a week up to 1 c.c., which is then continued indefinitely until the approach of spring, when the intervals are lengthened to 10 days or 2 weeks and the injections then stop-Repetition of the course of treatment for 2 successive years is advised as being more likely to yield permanent results. In addition, foci of infection such as infected sinuses and chronic tonsillar disease should be removed, the circulatory and nervous systems restored as nearly as possible to normal functioning, and a good general physical condition fos-

According to S. E. Kark (Lancet, Sept. 27, 1924), the common cold results from a too precipitate reaction in emergency heat regulation, and prophylaxis consists of training the auxiliaries of the heat-regulating center to respond quickly to altered temperature. In young children cold sponging should follow the daily tepid bath, and older children should have a cold shower. Breathing exer-

cises relieve nasal congestion through the suction action of deep inspiration.

TREATMENT.—Recognized procedures, as noted by Cecil (loc. cit.), include rest, preferably in bed; a simple diet; catharsis and analgesics, such as acetylsalicylic acid or pyramidon, for headache and pain in the nose and throat.

For abortive purposes, diluted argyrol may be used as a gargle, and a few drops of a 25 per cent. solution of it may be introduced in the nostrils.

Interest has been aroused by the experiences of E. B. Vedder and H. P. Sawyer (Jour. Amer. Med. Assoc., Mar. 8, 1924) in treating respiratory disorders by inhalations of dilute chlorine gas. A concentration of 0.021 mg. of chlorine per liter of air, which killed M. catarrhalis and B. typhosus in 45 minutes, was also found to be well within the limit of safety for inhalation treatment. Out of 388 cases of coryza inhaling 0.015 mg. per liter of chlorine in an airtight chamber for 1 hour (a small minority also getting repeated inhalations on successive days), 288 were cured, 91 improved and 9 unchanged. There seemed little doubt that the treatment aborted a cold when taken sufficiently early; in well developed cases it afforded great relief. Where nasal congestion interfered with the entrance of the chlorine, the nose was first treated with epinephrin. Out of 74 coryza patients treated in ordinary rooms with a portable chlorine apparatus, 72 were cured and 2 improved; most of these patients dealt with in this series received but one 1-hour treatment. See also CHLORINE.]

## ADDISON'S DISEASE.— SYMPTOMS AND ETIOLOGY.—

That secondary syphilis may fasten upon the adrenals and induce symptoms of Addison's disease was shown in a case reported by E. Otterström (Acta derm.-ven., Oct., 1923) in which, soon after an initial lesion, increasing lassitude and darkening of the skin appeared. The patient, a man of 33 years, experienced difficulty in walking, with pain in the hips. The Wassermann test was positive. Under antisyphilitic treatment the lassitude passed off, the skin discoloration was reduced, the blood-pressure was improved, and the Wassermann became negative.

Addison's disease due to malaria was witnessed by A. Lellis (Brazil-Med., Aug. 2, 1924), a bronze discoloration and extreme weakness appearing in a few weeks after the onset of the disease. After the malaria had been cured with quinine, the Addison symptoms still persisted, indicating injury to the adrenals by the malaria. When, however, adrenalin was given regularly, beginning in the fourth month, after the quinine had been stopped, the patient was soon enabled to return to his work, the drug having apparently relieved the adrenals of an excessive burden and allowed them to regain normal activity.

According to Bittorf (Münch. med. Woch., Feb. 23, 1923), the pigmentation in Addisonian bronzing is the result of an increase of the oxydases in the skin, while vitiligo is due the opposite condition.

TREATMENT.—Further valuable data on the organotherapeutic treatment of Addison's disease have been recorded by L. G. Rowntree (Jour.

of Pharm. and Exp. Ther., Mar., 1924). The complete treatment is designated as the Muirhead régime, with reference to Dr. A. L. Muirhead, Professor of Pharmacology at the Creighton Medical School, a sufferer from advanced Addison's disease, who was greatly benefited for a number of months by adrenalin given hypodermically and by rectum 3 times daily together with whole adrenal gland 3 times daily in doses representing maximal tolerance. writer refers to 3 groups of cases, comprising 4 not treated, 5 given glandular therapy but not a full Muirhead régime, and 9 receiving the full régime. All of the 1st group died within a few days or weeks of admission; those of the 2d group also died. Of the 3d group, 6 were living after 8 months, including 4, after 1 year to 16 months; of the other 3, 1 (Dr. Muirhead) lived for a number of months, while 2 succumbed within 1 month. Several patients went back to their work, some being restored to ½ to ¾ efficiency.

The pigmentation decreased materially in all of the 9 cases, and to a remarkable degree in some. Improvement, if prolonged, was accompanied by a gain in weight, strength and appetite, a decrease in gastrointestinal symptoms, and a rise in blood-pressure averaging perhaps 10 mm. Hg. Individual tolerance varied strikingly for either both adrenalin and whole gland or for the hypodermic and rectal use of adrenalin. Tolerance was not constant in the individual case. Intolerance for continued use of whole gland by the mouth was rather frequent, with epigastric burning, intestinal cramps, abdominal distress or nausea, in some instances necessitating reduction of dosage or intermission. This intolerance was less marked when the drug was taken on a full stomach, without apparent decrease of efficiency. Adrenalin by rectum is effective, increasing the blood-pressure; tenesmus is apt to develop on continuous use. In a syphilitic case, a grave Addisonian exacerbation followed each dose of arsphenamin unless preceded by adrenalin hypodermically.

Transplantation of sheep adrenals was tried in a case of Addison's disease by Currie (Can. Med. Assoc. Jour., July, 1924). The first transplantation of a single gland through an abdominal incision down to the deep fascia proved largely a failure. Later 2 adrenals were cut into fine strips and dropped into salt solution. The resulting tissue was skimmed out with a sterile spoon and dropped into a 10 c.c. syringe. Deep injections into the subcutaneous tissue on both sides of the abdomen were then made, 1/2 of the gland and salt solution being introduced on each side while the needle was being gradually withdrawn. Three months later, marked improvement had occurred.

In a case of Addison's disease and epilepsy in a syphilitic aged 45 years, C. I. Urechia and N. Elekes (Rev. franç. d'endocrin., Aug., 1924) witnessed a marked increase of muscular strength under injections of 2 to 4 c.c. (½ to 1 fluidram) of pineal extract (epiglandol).

ADENITIS.—SYMPTOMS AND DIAGNOSIS.—Since tuberculosis in children is generally glandular rather than pulmonary, the diagnosis of enlargement of the tracheobronchial glands

assumes considerable importance in E. D. Anderson these patients. (Jour. Amer. Med. Assoc., Oct. 6, 1923) made a study of the diagnostic signs of enlarged hilum glands in 90 tuberculous children. These glands may, of course, likewise be enlarged and give similar signs in measles, pertussis, influenza, chronic bronchitis, neoplasm, etc. The sign most often used, viz., whispered voice transmission over the spine, is often erroneously called d'Espine's sign, and consists in having the child whisper the words "one, two, three" and noting the level at which the sounds change from bronchial to vesicular; it is considered positive when this change occurs below the level of the 7th cervical vertebra. The true d'Espine's sign consists of a whispering sound heard after the spoken voice ("oh") over the spinous processes; it is considered positive if heard below the 7th cervical.

The whispered voice sign proved to be that most often present (38 out of the 44 children who showed 1 or more positive signs), and is the easiest to obtain accurately, but is often found in the absence of glandular enlargement. Twenty-six children had the change in breath sounds (bronchial to vesicular) below the 7th cervical; 26, the spoken voice sound (analogous to the whispered voice sound); 23, the change in percussion note over the spinous processes below the 7th cervical; 19, d'Espine's sign, and 16, interscapular dulness. The last-named proved to be the most accurate physical sign of bronchial adenopathy, although difficult to obtain correctly. None of the signs is conclusive. The level of the 7th cervical vertebra, generally specified as the limit of normalcy in

examining for hilum gland enlargement, is deemed by the writer too high.

According to M. G. Wilson, D. J. Edwards and I. D. Liss (Amer. Jour. Dis. of Childr., Jan., 1924), a reduction of vital capacity of more than 15 per cent. in an apparently normal child calls for an X-ray examination of the chest. They found diminished vital capacity and X-ray evidence of tracheobronchial adenopathy in 16 per cent. of white and 84 per cent. of colored subjects, apparently normal. In children with this disorder a reduction of vital capacity of from 15 to 42 per cent. was noted.

In regard to the diagnosis of tuberculous cervical adenitis in children, J. D. McEachern (Can. Med. Assoc. Jour., Dec., 1923) notes that in the few cases in which the diagnosis proves difficult a negative von Pirquet reaction is of value. The tonsils and adenoids should be removed and examined for tuberculosis. If there is still doubt, glandular tissue should be removed for examination. Where lymphosarcoma, Hodgkin's disease and syphilis can be excluded, enlarged nodes or masses in a child over 2 years old which remain visible for 2 months or more are certainly tuberculous. In lymphosarcoma the glands are usually large and non-fluctuating, and are widely disseminated. Chronic sinuses suggest tuberculosis.

ETIOLOGY.—Examining 36 enlarged tonsils from cases with marked cervical adenitis, W. G. Howarth and S. R. Gloyne (Lancet, June 16, 1923) found as chief histologic changes a marked increase in the lymphoid tissue and lesions in the crypts. Every tonsil showed bacterial infection, averaging 3 species of organisms, of which the streptococcus was the commonest. They believe that tu-

berculosis is only a late infection and that in the majority of cases cervical adenitis is due to septic absorption from tonsils containing pyogenic organisms. This is borne out by the fact that when the infected tonsils are removed the affected glands frequently subside.

Adenitis of the retromastoid or suboccipital glands is deemed by G. Blechmann and S. Delaplace (Nourrisson, Nov., 1923) to be present in about 30 per cent. of cases of obvious or suspected congenital syphilis in infants. Rickets, with local perspiration in the nuchal region, not infrequently coexists. Where enlargement of these glands is found in rickety children, a thorough investigation for syphilitic infection should be made. Tuberculous enlargements of these glands may likewise occur, but in this case the enlargement is greater than in syphilis and there is adhesion to the skin, with a tendency to suppuration.

P. Vallery-Radot (Bull. Soc. méd. des hôp. de Paris, Mar. 21, 1924) points out that a generalized adenitis may follow an injection of antiserum; a serum rash may or may not be present at the same time.

TREATMENT.—Chronic cervical adenitis has been widely regarded as almost synonymous with tuberculous adenitis. According to W. G. Howarth (Lancet, Mar. 29, 1924), however, there is no real evidence for this view, investigation of removed glands often showing no tuberculous lesion, but infection with streptothrix, streptococci or staphylococci, frequently of low virulence. In the treatment he advises, first of all, complete elimination of foci of infection or irritation, including impetigo,

seborrheic eczema or pediculi of the scalp, carious teeth, alveolar periostitis, unhealthy tonsils, ulcerative buccal lesions, discharging ears, and adenoids. In many cases the glands will then subside and eventually disappear. In slow cases particularly, fresh air in the country or at the seaside, a maximum of sunlight, and syrup of iodide of iron are useful. If the glandular enlargement persists, systematic exposure to the open air and sea bathing may be added. If a gland breaks down, aspiration and pressure or injection of bismuth-iodoform emulsion are serviceable. If frequent aspiration is likely to be necessary, a seton made of a double thread of strong silk, with the points of entrance and exit some distance apart, may be left in for 2 or 3 weeks, when a cure is usually obtained leaving only inconspicuous punctiform scars. rule, however, broken down glands heal if opened by a small incision, evacuated, and the abscess very gently scraped. It should be drained, not packed, with a small ribbon of bismuth gauze. The X-rays are of great value for healing sinuses and where much periadenitis exists. In advanced tuberculous adenitis extensive excision of the whole infected area is best.

For softening indurated tuberculous nodes, A. Mouchet (Méd. infant., Jan., 1924) advises injection of either a mixture of 2 Gm. (30 grains) of naphthol and 12 Gm. (2½ fluidrams) of glycerin or one of iodoform and ether. In cold abscess, repeated puncture from a point some distance from the affected glands, with a needle of intermediate caliber, is available. Internally, iodine should

be given in alternation with arsenic; codliver oil and calcium compounds may also be used. The X-rays accomplish little if the glandular enlargements are slight, but are valuable in periadenitis without softening. Eight or 10 exposures may be made at 10-day intervals, with the dosage from 3 to 4 H units. If there is fluctuation, evacuation should first be obtained and the rays then used cautiously. In ulcerative adenitis, the intervals should be long and the dosage small. The mercury vapor lamp or sunlight is of value.

In a case of chronic suppuration of the *submaxillary glands*, refractory for months under other treatments, Barrio de Medina (Arch. Españ. de Ped., Apr., 1924) witnessed rapid healing from 11 exposures to the **ultra-violet rays**. Success was also had in a case of tuberculous adenitis in the *axilla* with sinuses.

In treating tuberculous cervical adenitis with radium, E. S. Molyneux (Brit. Med. Jour., Nov. 10, 1923) aims to give a dose which will stimulate the tissues weakened by the infection, enable the phagocytes to consume the tubercle bacilli, and later assist the absorption of caseous material. The average period of exposure to radium is 4 hours, at first twice, then once a week. All cases have been benefited, and but 1 case thoroughly treated has not been apparently cured.

Mixed stock vaccines of streptococci and staphylococci are administered every 2 or 3 days in acute adenitis in children by R. Garelly (Arch. Españ. de Ped., Mar., 1924). Suppuration is usually prevented. The cases treated include those resulting from skin infections such as impetigo.

F. V. Hussey (R. I. Med. Jour.,

Jan., 1924) refers to limitations of the X-ray treatment of tuberculous cervical adenitis which prevent its use as a routine procedure. Where the glands are still discrete and even caseous but definitely encapsulated, and in the absence of systemic infection, he finds careful, thorough dissection of the neck the best procedure. Dissections of the anterior chain, when not broken down to the point of involving surrounding structures, are relatively easy and safe. Dissection of the posterior chain is more difficult, owing to the presence of the spinal accessory nerve, and the writer prefers opening of these glands, with thorough curettage and packing with gauze, and subsequent healing by granulation. The X-rays may be used postoperatively.

ADENOIDS.—In an attempt to throw light on the pathogenesis of the disturbances noted in subjects with enlarged tonsils and adenoids, as well as to explain the surprising results which follow their removal, some observers have suggested that these tissues may have some endocrin property or relationship. According to Poliakoff, e.g., the hypertrophied tissues secrete a substance capable of upsetting endocrin balance and hindering the functions of the endocrins in the normal development of the body. As noted by N. Gamaleia and F. Claude (Rev. de laryng., d'otol, et de rhinol., June 15, 1924), however, definite evidence in favor of such views is as yet very scanty. To investigate a possible relationship to the function of the thyroid, these observers made a study of the basal metabolism in 8 cases of enlarged tonsils or adenoids, single or combined,

in subjects 17 to 21 years of age. The clinical appearance of these subjects suggested a slowed rate of metabolism. In 4, the basal metabolism proved to be within 5 per cent. of the normal, or within the range of experimental error. Of the other 4, 2 showed increased and 2 decreased metabolism. In the cases with increased or normal metabolism, adenoid enlargements were usually small or absent, while in the 2 cases with a metabolism of 34 and 10 per cent., respectively, there were large adenoid vegetations. The "thyroid sign" of Parisot and Richard, consisting of a slowing of the pulse rate and fall of blood-pressure after injection of thyroid extract, and considered indicative of hyperthyroidia, was negative in all of the authors' cases.

> According to L. Wills and J. Warwick (Quart. Jour. of Med., Jan., 1924), adenoid cases can be divided into 2 distinct groups: (1) A normal postural group, with the adenoids showing an inflammatory state with increase of small lymphocytes and fibrous tissue, and (2) a hypotonic group, with exaggerated lordosis, pendulous abdomen and general lack of tone, the adenoids showing a hypertrophic state with increased size and number of the follicles and decrease of the small lymphocytes. Chest deformities occurring in either group are due to rickets, but the adenoid facies is due to the nasal obstruction.

TREATMENT.—As an adjuvant to surgical treatment, P. Brisotto (Arch. ital. di otol., etc., Apr., 1923) strongly recommends respiratory exercises. In 30 cases he found that even before surgical removal, such exercises soon lead to an increase of pulmonary ventilation, and that after operation they are even more effec-

tual, the volume of expired air being increased sometimes in 1 month by 1/3 and that of the inspired air by 1/4. The respiratory quotient and hemoglobin percentage were augmented at the same time. The exercises are performed 3 times daily, in a well ventilated room, for 5 minutes; a few drops of mentholated oil are dropped into the nostrils before each exercise period. The first exercise consists in breathing out as long as possible while bending forward so that the finger-tips touch the toes. During the succeeding inspiration the body is raised and the arms elevated above the head, then brought down to a horizontal, lateral position, and finally flexed so that the elbows come as close together as possible behind the chest. In another exercise the shoulders are elevated and retracted as far as possible during inspiration and lowered and brought forward during expiration. One of the daily exercise periods is preceded by running for 5 minutes, to deepen the breathing. The greatest benefit from these exercises is obtained if they are practised between the ages of 6 and 12 years. In patients over 20 years, their efficacy is reduced by the more complete, permanent growth of the respiratory structures and the greater difficulty in resuming a normal type of breathing.

According to J. D. Southard (Jour. Ark. Med. Soc., Dec., 1922), the X-rays, properly used, have proven to be a positive and reliable cure for adenoids and enlarged tonsils. The adenoids are exposed to the rays first through the nose and face, and then from behind forward with head ducked, so that the rays pass through the neck slightly to 1 side, then to

the other, of the cervical vertebræ. Intervals of 2 or 3 weeks are allowed to elapse between successive exposures through the same areas of skin.

Regarding adenoidectomy in adenoids, little of interest has appeared of late. S. Traina (Policl., Dec. 10, 1923) observed that in many children a previously positive Schick test became negative after the surgical removal of adenoids.

ADIPOSIS DOLOROSA.— PATHOGENESIS.—C. P. Waldorp (Endocrinol., Jan., 1924) notes that Dercum's disease has been considered a pluriglandular syndrome with pituitary changes predominating. The distribution of fat is similar to that in the adiposogenital syndrome, and in some cases of the latter disease there are likewise aching and tenderness of the fatty tissue, sometimes with physical and psychic asthenia and even mental disorders. The writer maintains that in both diseases there is disorder of the diencephalonwith the optic thalamus participating in the genesis of the pain-rather than of the pituitary. The pituitary was found involved in only 6 of 12 autopsied cases of Dercum's disease. After the disturbance of the diencephalon the thyroid and ovary probably later intervene in the production and maintenance of the obesity, though it remains of a frankly hypophyseal type. The muscular and cardiovascular asthenia can be attributed to disturbances of the adrenals or the vegetative nervous system, central or peripheral. It is not uncommon to find this accompanied by pigmentation of the skin and mucous membranes; even the ovary may contribute to its production by an endocrin-sympathetic mechanism. The psychic disturbances (not constant in Dercum's disease) can be attributed to toxic states of endocrin origin or to true encephalic lesions.

In a case of adiposis dolorosa in a woman of 67 years reported by P. Vallery-Radot and M. A. Dollfus (Bull, Soc. méd. des hôp. de Paris, July 6, 1922), the adiposity had for 33 years been confined to the upper limbs, chest, abdomen and buttocks; then the lower limbs became involved. She complained of chilliness and frequent flushes. There was alopecia in regions not affected by adiposity, viz., the scalp and eyebrows. The X-rays. showed increased length of the sella turcica, with the posterior wall thinned and concave, implying enlargement of the pituitary body.

TREATMENT.—In 3 cases recorded by H. Curschmann (Med. Klin., July 8, 1923) in women aged 42, 49 and 60 years the pains subsided and the obesity almost entirely disappeared under exclusive thyroid treatment. Similar results were obtained by F. Reichmann (Deut. med. Woch., Aug. 3, 1923) in the case of a woman of 49 in whom circumscribed, doughy, painful and tender callosities on the left arm had been ascribed to Dercum's disease. She also complained of paresthesias, heaviness and a feeling of exhaustion in the extremities, with inability to walk very far and difficulty in manual work. Thyroid gland was given to the amount of 0.01 Gm. (1/6 grain) 3 times daily, increased ultimately to 0.8 Gm. (12 grains) a day. Marked improvement occurred in all respects, and this was later repeated upon later return of symptoms due to inadvertent omission of treatment. Hydrotherapy and thermotherapy were also employed in this case.

ADRENALIN (EPINEPHRIN). -PHYSIOLOGIC ACTION.-Many aspects of the action of adrenalin have been investigated of late. Among them is its calorigenic action, studied by W. M. Boothby and I. Sandiford (Amer. Jour. of Physiol., Sept., 1923), who found evidence to the effect that adrenalin injected intravenously in doses within the power of the adrenals to secrete actually increases the rate of heat production, probably by increasing the formation of heat in nearly all types of cells. There is direct chemical stimulation of cell combustion. The respiratory quotient is raised and the blood sugar slightly concentrated.

From tests on the action of adrenalin on skeletal muscle, C. M. Gruber (Jour. of Pharm. and Exp. Ther., June, 1924) concluded that adrenalin chloride brings about a true increase in the height of contraction due possibly to increased irritability, to increased available energy or to its action as a catalyst in muscle metabolism. It shortens the latent period and the period of contraction. W. Salant and R. L. Johnston (ibid.) found that the action of adrenalin on the perfused frog's heart varies according to the hydrogen ion concentration of the perfused fluid. A low concentration of adrenalin in acid solution produced stimulation which was only. slight, transitory, and occurred only when the force and frequency of the heart were marked beforehand. When the heart action was previously moderate or weak, adrenalin in acid solution caused actual cardiac depression and sometimes also cardiac irregularity. D. Danielopolu and A. Carniol (Jour. de physiol. et de path. gén., No. 4, 704, 1923) point out that whereas adrenalin when given by the mouth increases gastric contractility, if given intravenously it increases the contractility only if given in small doses, large doses instead inhibiting it. They explain this apparent paradox as resulting from the fact that small doses affect only the vagus, but large doses chiefly the sympathetic. In the stomach, the vagus is solely affected, and contractility therefore increased, because the larger amount required to stimulate the sympathetic is rapidly destroyed by the gastric juice, only small amounts acting.

ABSORPTION.—That the lymphatic channels rather than the blood-vessels are concerned in the absorption of adrenalin when given subcutaneously is maintained by D. M. Lyon (Jour. of Exp. Med., Dec., 1923). This would explain the prompt relief obtained with it in asthmatic attacks in spite of the intense constriction of the vessels at the site of injection, which would retard blood-vascular absorption. In 50 patients receiving 0.5 c.c. (8 minims) of 1:1000 adrenalin solution subcutaneously, definite and concurrent effects on the volume of expired air (rise and subsequent fall), oxygen consumption, carbonic acid output, metabolic rate, respiratory quotient and systolic blood-pressure were observed. The reaction to adrenalin is proportional to the amount of the drug present in the blood at the time. None of it can be discovered in the blood after the reaction is finished. From the blanched zone about the adrenalin injection there can often be traced white lines; these do not correspond to blood-vessels, but resemble in distribution the red streaks of inflamed lymphatics seen in cellulitis. The rapidity of absorption is, however, evidently influenced by the rate of circulation, so that exaggerated reactions may occur in exophthalmic goiter irrespective of any hypersensitiveness of the tissues to adrenalin.

THERAPEUTICS.—Among the reports on intracardiac injection of adrenalin is a case of whooping-cough with suffocation in a child 21/2 years old, recorded by E. Baumann (Schweiz. med. Woch., Feb. 22, 1923). The child being apparently dead, after failure of artificial respiration and external cardiac massage, 1 c.c. (16 minims) of 1:1000 adrenalin was injected into the heart through the 4th intercostal space. Strong heart contractions began in 23 seconds and the breathing returned 3 seconds later. The child went through the remaining course of the whooping-cough and recovered. In another case, in a child of 6 years, with cardiac failure the result of chloroform anesthesia, intracardiac injection of 0.75 c.c. (12 minims) of adrenalin solution 4 minutes after cessation of breathing and heart-action was followed by recovery. Vomiting and epileptoid convulsions occurred, however, 4 minutes after the return of the vital functions, and fever

persisted for 4 days thereafter; the writer, therefore, advises that not over 0.5 c.c. (8 minims) be injected in young infants and 1.5 c.c. (24 minims) in adults. In the adult, he advises injection just above the 5th rib, 5½ centimeters (2½ inches) from the left sternal border.

In a second stage operation for prostatic hypertrophy in a man aged 69 years, P. B. Champlin (Jour. Amer. Med. Assoc., July 21, 1923) witnessed collapse immediately after an injection for caudal anesthesia with 0.5 per cent. procaine. Artificial respiration, oxygen and stimulants having failed, 10 c.c. (21/2 fluidrams) of 1:1000 adrenalin chloride solution were injected into the left ventricle through a puncture about 5 cm, to the left of the sternal margin in the 5th intercostal space, about 5 minutes after the patient had collapsed. The heart began beating so vigorously that abdominal aortic pulsation was seen through the abdominal wall in 30 seconds following the injection. The patient recovered and was successfully operated on a week later under the same form of anesthesia.

A. Worcester and D. O'Hara (Boston Med. and Surg. Jour., Jan. 18, 1923) report the case of a man aged 60 years with hepatic cirrhosis in which adrenalin injections relieved not only asthmatic attacks from which the patient suffered but also his complaint of epigastric distress, described as a "lump in the stomach." The 1:1000 solution was injected in doses of 1 c.c. (16 minims) at average intervals of 4 hours for over a year, to a total of over 3 liters of solution. This failed only once to relieve the epigastric discomfort. The relief could be accounted for either through motor inhibition of a stomach distended with gas or through a decrease of the amount of blood entering a distended portal circulation by a change of blood distribution produced by the adrenalin. Through the period of adrenalin administration the blood-pressure averaged 130 mm. Hg as against 110 in the previous year.

UNTOWARD EFFECTS.—Sawdon (Brit. Med. Jour., Nov. 4, 1922) has reported the case of an asthmatic woman who was in the habit of giving herself hypodermic injections of 10 minims (0.6 c.c.) of 1:1000 adrenalin solution 2 or 3

times a day. On 1 occasion she took 6 doses of 20 minims each at 2-hour intervals without much relief but with toxic effects. When first seen she was extremely pale and almost pulseless, with intense thirst, anuria and blurred vision. Rapid improvement followed administration of amyl nitrite. Upon subsequent use of morphine and atropine to relieve the asthma, her condition returned to normal.

ADRENALS.—PHYSIOLOGY.— That the adrenal secretion plays a part in the control of body temperature has been demonstrated by W. B. Cannon and A. Querido (Proc. Nat. Acad. of Sci., June, 1924), who were able to show that cold increases the output of adrenalin from the suprarenal medulla. This results in a chemical augmentation of metabolism, thus increasing the amount of heat produced in the tissues. If, in the experimental animals, the function of the adrenal is excluded, this chemical increase of metabolism no longer occurs. Again, Cannon and J. R. Pereira (ibid.) have recorded further investigations tending to show that the marked heat production in fever may be a result of increased adrenal secretion. This harmonizes with the reduction of the adrenalin content in the medullæ of the adrenals in the presence of infections. The influence of the adrenals on metabolism is also illustrated by the experiments of M. A. McIver and E. M. Bright (Amer. Jour. of Physiol., May, 1924), showing that in anesthesia by urethane, which stimulates the adrenals, removal of the latter results in a fall of metabolism. Direct splanchnic or reflex stimulation of adrenal secretion resulted in a prompt increase of metabolism averaging 20.2 per cent. Adrenin did not appear to require the cooperation of the thyroid in producing increased metabolism.

Upon simultaneous removal of both adrenals in dogs, A. Bornstein and K. Holm (Zeit. f. d. ges. exp. Med., xxxvii, 1, 1923) found the chief symptom to be an increase in respiration, the intake of air being usually doubled and often quadrupled, though oxygen consumption, as well as the alveolar carbon dioxide tension, are greatly reduced. The carbon dioxide combining power of the blood decreases. The overventilation after the operation in every

way resembles that of forced respiration in man, true acapnia resulting in each case. The cause of the central stimulation leading to the over-ventilation was not ascertained. Morphine in large doses did not prevent it, and infusion of adrenalin did not postpone the time of death, which occurred in 7 to 12 hours after the operation.

By succeeding in removal of the ciliary ganglion as well as the superior cervical ganglion in the cat, F. A. Hartman, H. A. McCordock and M. M. Loder (Amer. Jour. of Physiol. Mar., 1923) obtained a complete denervation of the iris, rendering the pupil an indicator of extra adrenin in the circulation. The widest dilatation of the pupil, indicating the greatest discharge of adrenin, occurred in brief asphyxia, and after it, in order, came chilling by a cold bath, pain by electric stimulation of the ear, and excitement due to proximity of a barking dog. A discharge of adrenin during surgical procedures was indicated, in spite of ether anesthesia.

A. Tournade and E. Chabrol (Rev. de méd., Apr., 1923), in refutation of Gley's assertion that the adrenals play no part in the maintenance of normal blood-pressure, point out that the effect of decapsulation in lowering blood-pressure is soon, if not immediately, corrected by transfusion of adrenal venous blood. Internal secretion by the adrenals is not occasional, they maintain, but a constant process which takes place in the absence of any artificial stimulation of the splanchnic nerves.

According to R. McCarrison (Brit. Med. Jour., Jan. 20, 1923), the enlargementwith increased adrenalin content-of the adrenals in inanition and in avitaminosis may be correlated with the acidosis associated with these conditions. Its occurrence during the terminal phases of avitaminosis, its association with marked respiratory disturbances, with falling body temperature and with interference with oxygenation, and its rapid disappearance on the provision of the missing vitamins, suggest that it is an emergency effort on the part of the adrenals. The attempted exercise of emergency function by the adrenals may be expected to occur in all conditions of alkalosis or of acidosis.

Recent experimentation has brought into further prominence the importance of the adrenal cortex. Experiments by B. A. Houssaye and J. T. Lewis (Amer. Jour. of Physiol., May, 1923) in dogs, convinced them that the adrenal cortex is indispensable to life, maintaining its vital functions without the cooperation of the medulla, and that the adrenal chromaffin tissue is not necessary to life or to normal functions. Dogs survive extirpation of all chromaffin tissue contained in the adrenals but if the cortex is removed, they die as after adrenalectomy. Upon removal of the adrenal medulla alone, pigmentation and asthenia are not observed, sympathetic irritability is normal, and the blood-pressure responds normally to pituitrin. Pancreatic diabetes can be established without secretion of adrenalin.

By combined surgical removal of part of the adrenals and implantation of radium into the remainder, G. B. Wislocki and S. J. Crowe (Johns Hopk. Hosp. Bull., June, 1924) were able to destroy the medulla of the adrenals and the abdominal chromaffin body in the dog without producing symptoms. The presence of at least one-fifth of the total of adrenal cortex was found necessary for the maintenance of life. After removal of all the cortex the animals died with a terminal fall in blood-pressure and temperature.

The resistance of rats to bacterial intoxication was found by W. J. M. Scott (Jour. of Exp. Med., Mar., 1924) to be greatly decreased after double adrenalectomy. This decrease is dependent on functional insufficiency of the adrenal cortex. A dose of killed streptococci or staphylococci can be obtained that is invariably fatal to adrenalectomized rats before the hypertrophy of the cortical accessories has occurred, but which never kills control rats.

The cortex seems to be affected, according to F. A. and W. E. Hartman (Amer. Jour. of Physiol., Aug., 1923), by any condition causing a marked increase of adrenalin output for a considerable time. This might be due to an excessive activity of the cortex in the production of adrenalin. Though adrenalin has never yet been isolated from the cortex, the authors think the latter may produce it and then

transfer it to the adrenal medulla. The cortex is capable of inhibiting contracting intestine and of causing dilatation of the sensitized pupil.

Discussing the participation of the adrenals in the action of certain alkaloids, C. W. Edmunds and P. C. Lloyd (Jour. of Lab. and Clin. Med., Oct., 1923) note that pilocarpine, physostigmine and strychnine increase the amount of adrenalin in the blood by stimulating the adrenals. The direct action of pilocarpine on the uterine and intestinal muscles is counteracted by this increased adrenalin content of the blood. Physostigmine and strychnine in dogs produce an increase of the leukocytes, as does adrenalin. After removal of the adrenals this increase is replaced by a decrease, showing that the leukocytosis had been due to stimulation of these organs. The adrenalin, in turn, probably acted on the blood-forming organs. Atropine and curare in large doses seemed to produce functional inactivity of the adrenals.

HYPOADRENIA.—A new sign of adrenal insufficiency is described by C. F. Arroyo (Med. Iber., Oct. 13, 1923). The iris, while reacting to light, does so in a sluggish, "asthenic" manner. After the initial myosis, the pupil begins to dilate slowly and as though struggling to maintain contraction. It becomes definitely dilated only after about 40 seconds' contention between contraction and dilatation, in spite of the continued presence of the exciting agent (light). This sign, it is asserted, occurs constantly in all forms of hypoadrenia, and is not seen in normal subjects nor various kinds of chronic visceral disease. It is reduced or dispelled by suprarenal treatment.

In a case of chronic adrenal insufficiency ascribed by W. H. Deaderick (Amer. Jour. of Syph., Jan., 1923) to syphilis of the adrenals, the patient, a woman of 40 years, had had 3 miscarriages and no full-term labors, and

the husband admitted an earlier syphilitic infection. The symptoms were hepatic pain and vomiting attacks of increasing frequency, loss of weight, inability to sit up, dyspnea on exertion, sore throat and enlarged cervical glands. Later, skin pigmentation, pain in the right hypochondrium and precordium, backache and constipation were observed. All the systemic symptoms were improved by daily intramuscular injections of mercury benzoate, up to 1/3 grain (0.02 Gm.) for 3 weeks. Later, the pigmentation also faded.

In a case of calcification of the adrenals seen by A. R. Newsam (R. I. Med. Jour., Mar., 1924), a girl aged 2 years 7 months showed sudden unconsciousness followed in 3 hours by clonic convulsions, incontinence, vomiting and coma. Cyanosis and frothing at the mouth occurred during convulsions. Following a severe convulsion the abdomen rapidly distended and death occurred in spite of the rectal tube, oxygen, etc. At autopsy the adrenal medulæ were found replaced by calcified material, and very little of the cortices remained.

In a woman of 46 years with Addisonian symptoms observed by H. R. Wahl (Med. Clin. of No. Amer., vii. 1357, 1924), an "early menopause" had occurred at the age of 27. At autopsy the adrenals were found unusually small, and microscopically there was found an almost complete atrophy of the adrenal cortex. In view of the close relationship of the adrenal cortex to the gonads, it is suggested that a process of atrophy of the cortex had set in with the cessation of menstruation.

Attention has been directed of late to the possible development of insufficiency of the adrenals as a result of X-ray exposures over these organs. Tuffier (Bull. de l'Acad. de méd., June 17, 1924) reports a case of very low blood-pressure with refractory vomiting and severe hematemesis for 6 weeks after deep exposures over

the back, finally arrested by injections of adrenalin. He suggests that adrenalin be given prophylactically where such exposures are to be made, unless protection is given the adrenals with a lead plate. A. Zimmern (ibid., June 10, 1924) states that where the adrenals are normal they are only slightly sensitive to ordinary X-ray exposures, but that their sensitiveness increases when they are diseased. Arrillaga and Izzo (C. r. Soc. de biol., June 13, 1924) report the case of a man of 39 with mild Addison's disease who received a 42minute deep X-ray treatment for epithelioma of the tonsil. In this case the acute X-ray intoxication appeared to react on the adrenals, intense adrenal insufficiency setting in at once and the patient being roused from coma only by 2 adrenalin injections. He died on the 5th day and examination of the adrenals confirmed a recent exacerbation of a destructive process in these organs. Prophylactic as well as therapeutic use of adrenalin is advocated. O. David and A. Hirsch (Berl. klin. Woch., Apr. 23, 1923) had concluded from experiments in animals that a skin dose of the X-rays distinctly reduces and a 1/4 skin dose increases adrenal functioning. Zimmern (loc. cit.), however, never noticed any rise of blood-pressure from adrenal radiation and deems a stimulating effect of the rays on adrenal secretion improbable.

HEMORRHAGE.—Hemorrhage into the adrenals is more common than is generally realized, and arrests the functioning of these organs, with resulting manifestations of acute adrenal insufficiency. The amount of hemorrhage is, however, variable,

ranging from pin-point hemorrhages to complete destruction of the organ. According to M. A. Rabinowitz (Amer. Jour. Med. Sci., Oct., 1923), an acute illness in a previously healthy child, rapidly followed by purpura and collapse, should, in the absence of evidences of meningococcic infection, be sufficient for a diagnosis of adrenal hemorrhage. Bacterial or food toxins may be its cause; injection of various germs in animals has induced it. When but 1 adrenal is involved, it is usually the right. Both the cortex and medulla are affected. The onset of symptoms is usually sudden. Often the infant awakens early in the morning, is restless and cries. Later there may be sudden abdominal pain, vomiting and diarrhea, or one or more convulsions. In a few hours purpura sets in. Fever, rapid pulse, cyanosis and rapid respiration are present. Tympanites may occur, but the abdomen is usually not tender. If, however, the hemorrhage is such as to rupture into the peritoneal cavity, an acute surgical condition may be mistakenly suspected. the heart weakens the child becomes drowsy, inert and finally comatose. Fever continues until shortly before death, at which time convulsions or a fall of temperature may occur. Exitus takes place in 6 to 48 hours from the onset. In 1 of the writer's cases, an infant of 18 months, the temperature rose to 107.5° F., and the respiration to 72. Slate-blue spots of split-pea size covered body, especially the face, back and limbs. Treatment proved unavailing, Cheyne-Stokes respiration set in, and death occurred in 20 hours. The adrenals were found greatly enlarged and diffusely infiltrated with blood. In another, rather similar case, a wide dilatation of the pupils was particularly noted. The left adrenal was reduced to a sac filled with dark blood and the right was markedly hemorrhagic.

A case in a woman aged 59 is reported by A. G. M. Severn (Lancet, Mar. 31, 1923). The symptoms were abrupt collapse, cyanosis, abdominal distention and death in 3 hours.

TREATMENT.—As described by Rabinowitz, this consists of repeated large doses of caffeine, strychnine, camphor, pituitrin or adrenalin in oil, given intramuscularly. Saline hypodermoclysis with a minute amount of adrenalin may be employed, and as a last resort, repeated intracardiac adrenalin injections. Antimeningococcus serum may be serviceable where the cause is a fulminating meningococcus septicemia.

ADRENAL TUMORS.—That adrenal tumors may result in virilism with hypertrichosis, blood-pressure increase and other peculiar manifestations is now well known. In a case reported by Sézary and Lomon (Bull. Soc. méd. des hôp. de Paris, Dec. 28, 1923), the X-ray proved diagnostically serviceable. The disorder had been manifested for 2 years in hirsutism, complete amenorrhea, facial adiposity, lumbar pains, high blood-pressure and tachycardia. The patient was a young woman of 20 years. The X-ray revealed a knobby tumor covering the upper half of the right kidney; the latter was neither displaced nor distorted.

A. Collett's case (Amer. Jour. Dis. of Childr., Mar., 1924) is unusual in that the patient not only survived

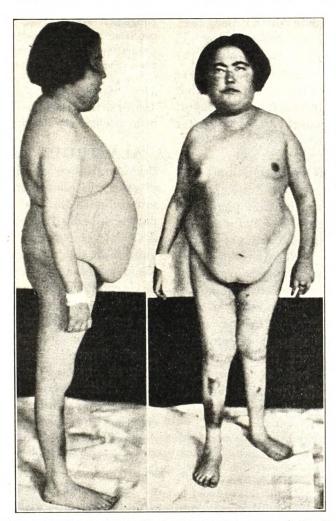
operation but showed improvement in the genital manifestations there-In this child of 18 months, there was marked hair growth over the trunk and extremities, with deep voice and abnormal weight and plumpness. A penile organ replaced the clitoris and the labia majora and mons were well developed. Later the tumor, above the left kidney and measuring  $3\frac{1}{2}$  by  $2\frac{1}{2}$  centimeters, was removed. It showed hyaline degeneration and lime atrophy; this presumably accounted for the fact that the virile development had stopped about 8 months before the operation. Fourteen months after the latter the child's appearance was strikingly improved. The abnormal hair growth had almost entirely disappeared, the labia and mons were less prominent, and the penile organ was perhaps The voice remained deep and the child was nervous and sometimes depressed, but in general lively and intelligent.

In the case of a girl aged 12 reported by B. S. Oppenheimer and A. M. Fishberg (Arch. of Int. Med., Nov., 1924), the chief complaints were weakness and adiposity. Strabismus had been present since infancy, and an operation for double cataract performed at 5 years. At 5½ years she had suddenly become adipose, gaining about 75 pounds in 1 year. Skin discoloration and somnolence appeared, with glycosuria and polyuria. At 11 years hair began to grow on the face, axillæ and pubis; menstruation did not occur. At 12 she appeared undersized, many years older than her actual age, exceedingly obese and with a red. plethoric face [see illustration]. The blood-pressure was 190 systolic, 130

diastolic. There were abscesses on the back and neck, and ulcers on the legs. There were no sellar changes and basal metabolism was practically normal. The glycosuria and albu-

tumor of the suprarenal cortex in young children, especially girls.

**HYPERNEPHROMA.**—Out of 32 cases of hypernephroma operated at the Johns Hopkins Hospital in 16



Suprarenal hyperplasia in a girl of 12, showing pubertas præcox, obesity, hirsuties of the chin, cheeks and eyebrows, striæ atrophicæ of the abdominal wall, and an adult physique (Arch. of Int. Medicine).

minuria disappeared under an antidiabetic diet, and the abscesses healed, but death occurred 3 weeks after she left the hospital. The triad of sexual precocity, obesity and heterosexual virilism is practically pathognomonic of hyperplasia or years, 62 per cent., according to M. Cutler (Johns Hopk. Hosp. Bull., July, 1924), were in subjects 40 to 60 years of age. Injury was a possible inciting factor in 10 per cent. Hematuria was the commonest symptom, and was the initial symptom in

68 per cent., commonly following overexertion. Pain was present in 91 per cent. of cases, renal colic in 67 per cent., dysuria and urinary retention in 25 per cent., and frequency of urination in 12 per cent. There was a palpable tumor in 80 per cent. Weakness, malaise, dyspnea and loss of weight were present in 60 per cent. The treatment in all cases was nephrectomy. Out of 18 cases that could later be traced, 8 were living at intervals of 8 months to 9 years after operation.

AËROPHAGIA.-J. Belot (Bull. Soc. de rad. méd. de France, Nov., 1923) points out that aërophagia, in conjunction with locally increased tonicity of the muscular layers of the stomach, may produce a gastric distortion suggestive of hour-glass stomach on X-ray examination. He witnessed this condition in a man 50 years of age. Further study showed that the shape of the stomach varied at different times and that there was no residue in it after meals. Ultimately the organ returned to normal.

AFENIL.—Afenil, or calcium chloride urea, is a molecular compound of calcium chloride and urea having the chemical composition CaCl<sub>2</sub>. 4(NH<sub>2</sub>)<sub>2</sub>CO. A sterile 10 per cent. solution of it is marketed in ampules each containing 10 c.c., this constituting the equivalent of 0.11 Gm. (1.7 grains) of calcium. The compound itself occurs in colorless crystals, freely soluble in water. It is credited with having the same actions as calcium chloride, for which it is advantageously substituted for intramuscular or intravenous use, being less irritating. The average dose of the 10 per cent, solution is 10 c.c. (2½ fluidrams).

THERAPEUTICS.—Intravenous use of afenil is asserted to be serviceable in hay fever, asthma, anaphylactic conditions, urti-

caria, and for the prevention of severe arsphenamin reactions. According to Stümpke (Münch. med. Woch., Jan. 18, 1924), it is also useful in angioneurotic states, including angiospasm, on account of the sedative action of calcium on overexcited nervous structures, and likewise in congenital syphilis, scrofula, prurigo and pruritus, hemorrhages from the female generative tract, endometritis and dysmenorrhea. Its use may or may not be followed by a slight increase in the calcium of the blood. It is considered contraindicated in arteriosclerosis, myocarditis and long-standing valvular disease.

ALASTRIM.—The question of the identity or non-identity of this disease with smallpox is not yet definitely settled. According to L. Bernard (Bull. de l'Acad. de méd., Oct. 2, 1923), the arguments so far advanced in support of the identity of the diseases are not convincing, and he is inclined to regard them as 2 different conditions. Those affected are exclusively members of the negro race or have an admixture of negro blood. There is fever for 1 or 2 days, then an eruptive period of about 20 days characterized by vesiculopustular lesions, and finally a stage of crusting and scar-formation of about 3 months' duration. This special stage of regression, the relative absence of suppuration in the pocks and the mildness of the general symptoms distinguish the 2 diseases. Not only have many successfully vaccinated persons contracted alastrim, but an alastrim patient has shown typical vaccinia upon vaccination and another individual has contracted alastrim 3 years after having smallpox.

On the other hand, H. W. Hill (Can. Med. Assoc. Jour., Jan., 1924) maintains that alastrim, amaas, Kafir-

pox, Cuban itch, Sanaga-pox, glass-pox, milkpox and mild smallpox are clinically indistinguishable. They are all prevented by vaccination. An epidemic of alastrim in Antigua in 1923 was rapidly checked by almost universal vaccination and other customary precautions against smallpox. He maintains that every item of proof so far accumulated indicates that alastrim is merely the mild smallpox of the temperate zone under another name.

ALBUMINURIA.—The question of the exact clinical significance of albuminuria has been further investigated by T. H. Coffen (Arch. of Int. Med., Apr., 1923). Albuminuria is not a sure indication of damaged kidneys, since it may appear with normal kidneys, as in the orthostatic form, or may be absent in a widespread degeneration of these organs, as in interstitial nephritis. The writer was led by clinical observation to recognize the following forms of albuminuria due to extrarenal factors: (a) Physiologic, adolescent or functional albuminuria; (b) albuminuria in cardiac decompensation with resultant passive congestion (oliguria, edema, uremic symptoms). The latter forms he further divides into a group due to valvular lesions or myocardial weakness and a group resulting from long-continued vascular hypertension with final cardiac breakdown. Albuminuria is very frequent in arterial hypertension; while chronic interstitial nephritis is assumed to be present, the "renal crisis" is often due to myocardial weakness resulting in passive renal congestion. congestion often produces a heavy albumin reaction which clears up on relief of the cardiac or arterial etiologic factor. Chemical examination of the blood seems to offer a means of early differentiation between renal and extrarenal albuminuria. The test diet for fixation of specific gravity of the urine and for the estimation of chloride and nitrogen excretion and water output also gives an early clue.

Albuminuria

Albuminuria with tonsillar disease is emphasized by C. P. Jones (Va. Med. Mthly., Apr., 1924). After acute tonsillitis he found albumin in 40 per cent. of cases, albumin and pus cells in over 25 per cent., and albumin, pus cells and casts in 5 per cent. Any diseased tonsil or tonsillar remnant may induce systemic complications leading to renal changes. The treatment is thorough enucleation of the tonsils, including the subtonsillar tissue, and of adenoid vegetations. Out of cases of silent tonsil (without acute infection) 4 showed pus cells in the urine, 3 erythrocytes and pus cells, and 1 casts. After a thorough operation, the albuminuria disappeared in from 5 to 51 days.

In the case of a girl of 18 reported by F. Hijmans (Nederl. Tijd. v. Geneesk., May 24, 1924), a diagnosis of kidney stone had been suggested because of pain, slight hematuria and considerable albuminuria with casts. No other evidences were found, however, and the albumin and casts were observed to occur only with the attacks of pain. The tender colon suggested a colitis with resulting vagotonia and reflex contraction of bloodvessels. The importance of examining several samples of urine at different times of the day is emphasized.

Albuminuria ranging from a trace to 0.05 per cent. was found by M. Labbé, P. L. Violle and F. Nepveux (C. r. Soc. de biol., July 18, 1924) in

ALCOHOL.—PHYSIOLOGIC ACTION.—Among the number of contributions which have appeared in recent years on this subject is one by W. W. Tuttle (Jour. of Pharm. and Exp. Ther., Apr., 1924), who, in relation to the question whether alcohol first stimulates and then depresses the nervous system or has only a depressor effect, studied the effect of alcohol on the patellar tendon-reflex in 12 healthy men ranging from 18 to 43 years of age. The alcohol was given either in the form of whiskey or of a "synthetic gin" made by adding 400 c.c. of 95 per cent. alcohol to 600 c.c. of water, together with 5 ounces of glycerin and 5 drops of oil of juniper. Single or repeated doses of 20 to 100 c.c. of the alcoholic preparations were given. Usually the subject was allowed to deliver normal knee-kicks for some minutes before taking the alcohol. Nine subjects showed augmentation, 2 depression of the knee-kicks by alcohol, and 1 no effect. Those with augmentation drank alcoholic liquor only occasionally, while those with depression were accustomed to drinking alcohol daily. In the subjects with augmentation, when the normal responses were low the hyperactivity due to the alcohol was more marked than when the normal responses were high. This conforms to the physiologic law that the greater the initial activity of any structure the less effect will any given added stimulus invoke.

Vartia, Loveson and Korhonen (Finska läk. handl., Mar.-Apr., 1924) ingested large quantities, up to 2 liters at a time, on an empty stomach, of beers of from 1.73 to 2.74 per cent. alcoholic content to test the

effect of such amounts of beer on coördination. The criterion was the number of sewing needles that could be threaded in a given time. The strongest beer was found to have a slight inhibiting influence on the mechanical performance, while with the lower alcoholic contents there was no perceptible effect.

In regard to the action of alcohol on the circulation, it is generally agreed that an increase in the pulse rate usually follows its use. At least a part of this acceleration occurs reflexly, through stimulation of the mucous membranes by it; such acceleration may follow the mere taking of 50 per cent. alcohol in the mouth and its rejection without any of it being swallowed. Testing the direct action of alcohol on the myocardium by means of the isolated dog heart (heart-lung preparation), R. Sulzer (Heart, Apr., 1924) found no evidence of any stimulating effect of alcohol on the heart in any doses. With concentrations of alcohol in the blood of 0.06 per cent., the only effect was an increase in the diastolic and systolic volumes of the heart (an unfavorable indication). With higher amounts, such as 0.3 or 0.4 per cent., there was a diminution of cardiac output and a rise in the venous and pulmonary pressures. [Though these experiments indicate that alcohol is not a direct heart stimulant they do not invalidate other, indirect beneficial effects it may have on the circulation, since clinically one is not dealing with an isolated heart.—Ep.]

Investigating the effect of alcohol on yastric juice acidity in 132 cases, K. Frehse (Deut. med. Woch., Jan. 5, 1923) found no change in acidity in healthy individuals when 2.5 or 10

per cent. of alcohol was added to the Ewald test-meal. In nervous dyspepsia, however, the acidity was, as a rule, increased, while in gastric ulcer it was usually decreased.

In a report recently issued by the Advisory Committee of the Central Control Board (Liquor Traffic) of London (Alcohol: Its Action on the Human Organism, 1924), it is pointed out that while food in the stomach, by slowing the absorption of alcohol, lessens the degree of resulting inebriation, some kinds of food produce a greater effect than others. milk, or bread and milk, taken 21/2 hours before alcohol, caused a slower absorption than any other food tested, whereas meat had but little influence on absorption. Impairment of speed and accuracy in typewriting was much lessened by taking the alcohol with or soon after food. The view that malted liquors are good for nursing mothers is asserted to be unsupported by reliable evidence. The value of wine in convalescence is ascribed mainly to greater contentment and improved appetite. Alcoholic beverages are regarded as definitely dangerous in children and most individuals with an unstable nervous system. Exercise engenders an augmented demand for alcohol as a supposed aid to labor; hence the opinion that excess of alcohol is more prejudicial in persons leading a sedentary life is not supported.

R. Pearl (Brit. Med. Jour., May 31, 1924) has reported a study of the effect of alcohol on life expectancy, based on data obtained from 6000 individuals among the working classes in Baltimore. At every age from 30 to 100 years, the persons in the "all moderate" class of drinkers, whether male or female, showed a slightly higher expectation of life than the persons in the "abstainer" class. Males or females in the "all heavy" class, however, showed a markedly

lower expectation of life than those in the "all moderate" or "abstainer" classes, with the exception that males from age 60 on showed a somewhat higher expectation in the "all heavy" class than in the "abstainer" classa fact possibly due to a selective effect of the very high mortality in the heavy drinking group prior to age 60. The class of "moderate steady" drinkers in both sexes consistently showed the highest expectation of life at all ages from 30 to 100 years, with the exception that after age 70 the "all moderate" male group had very slightly higher expectations than the "moderate steady" male group.

> The selective action of alcohol in raising the standard of resisting power by eliminating the weaker germ-cells is brought out in a research conducted by C. R. Stockard (Amer. Jour. Med. Sci., Apr., 1924) in 5000 guinea-pigs, which led to the consideration of alcohol as a factor in eliminating racial degeneracy. Over 100 guinea-pigs were treated with the fumes of 95 per cent. alcohol to the point of intoxication 6 days per week for varying periodssome as long as 6 years. This procedure failed to injure the health or activities or to any degree shorten the life of the treated guinea-pigs, but there were marked effects on the offspring. Whereas, in the offspring of normal pigs the mortality during the first 3 months of life was less than 23 per cent, and none of these offspring were defective, in the offspring of alcoholic mothers and normal fathers the mortality was 43.4 per cent. and 6 per cent. of the offspring were structurally defective, and in the offspring of alcoholic fathers and normal mothers the mortality was 35.1 per cent. and 5 per cent. were defective. In the normal matings the mortality occurred ½ before and ½ after birth, while in the alcoholic matings the prenatal mortality was

twice the postnatal. In subsequent generations the animals showed a progressively decreasing mortality in the offspring and of prenatal mortality until, in the 4th generation, the mortality was but 13.5 per cent. as against the control 21 per cent., and the prenatal mortality was reduced to but little over ½ the postnatal rate. All the weak and altered germ-cells having thus been eliminated, a group of superior animals averaging well above the controls was obtained, *i.e.*, an improvement in the quality of the race.

untoward effects.—Nystagmus and paresis in some of the movements of the eyes were uniformly observed by W. Runge (Deut. med. Woch., Mar. 7, 1924) in alcoholic intoxication. In some instances these disturbances were noticed even before the unsteadiness of gait. They may be present for 7 hours or even longer, up to 24 hours.

Pointing out that alcoholism is the principal cause of a serious amount of insanity, Bedford Pierce (Lancet, Apr. 26, 1924) dwells on the great variety of abnormal mental states, few of them distinctive, to which it may give rise. Aside from the well-known delirium tremens, mania a potu, acute alcoholic hallucinosis and polyneuritic psychosis (Korsakov's syndrome), the most common of the mental disturbances is a mild mental enfeeblement, escaping the notice of the casual observer, but quite apparent to intimate friends. In some cases there is a progressive amnesia, which may be due to a complication such as arteriosclerosis. Another common type begins with delusions of suspicion, and rapidly reaches a paranoiac condition. Hallucinations of hearing are frequent, and the delusions generally refer to persecution by unseen enemies; such patients are often homicidal. The illness is usually shorter than true paranoia, and advancing dementia softens the clinical features. Between these types are many cases which, when compelled to abstain, become excellent workers, neither recovering nor deteriorating further, e.g., the epileptic type and the pseudo-paralytic type, which may exactly picture general paralysis in speech, gait and behavior. Finally, there are protean cases of maniacal excitement, depression or confusion.

The chemical blood changes in chronic alcoholism were studied experimentally by F. R. Nuzum and G. D. Maner (Jour. Amer. Med. Assoc., Aug. 11, 1923), who gave rabbits each day by stomach tube 10 c.c. of 95 per cent. alcohol in 50 c.c. of water. Out of 24 animals, 4 developed chronic alcoholism, and in these a definite acidosis was constantly present. At the same time there was an approximate doubling of the non-protein nitrogen and urea nitrogen of the blood. Animals with an early marked acidosis developed chronic alcoholism more quickly and often died much more quickly than others with less acidosis. The writers regard acidosis as an important factor in both acute and chronic alcoholism and probably a cause of the gross tissue changes and of the edema of delirium tremens. The kidneys histologically showed little change. Reference is also made to Duccheschi's finding of a constant increase in the cholesterin, lecithin and fatty acids of the blood in dogs given daily intoxicating doses of alcohol, and of the cholesterin in 62 habitual drinkers.

PROPHYLAXIS.—According to figures made public in 1923 by S. D. Hubbard, Director of Public Health Education in New York, there has been an increase in this city, since the last year before the prohibition law went into effect, in the number

of arrests for drunkenness, deaths from wood alcohol poisoning and admissions for acute alcoholism to the Bellevue and Kings County Hospitals. The admissions for acute alcoholism were 5624 for 1922 as against 3345 for 1921, and the number of deaths was 295 as against 141. In 1916, however, there had been 690 deaths. The arrests for drunkenness rose from 5936 in 1920 to 7866 in 1922. The conclusion expressed is that prohibition has increased the number of immoderate drinkers in New York City, and that those who drink have turned from beer to spirits.

Similar conditions are reported from Chicago by F. J. Gerty (Ill. Med. Jour., Aug., 1924). At the Cook County Hospital, 827 alcoholics were admitted in 1912 (peak year) before prohibition, 99 in 1916, 199 in 1917, 149 in 1918, 168 in 1919, 641 in 1920, 911 in 1921, and 1130 in 1922. As regards delirium tremens, Capps and Coleman reported the number of cases as having decreased from 33 in 1916 to 1 for the years 1921 and 1922 together. At the Psychopathic Hospital, there were received 377 alcoholics in the 1st half of 1917, 82 in the 1st half of 1920, and 539 in the 2d half of 1922. The coroner's findings showed 11 deaths due purely to alcoholism in 1917, 4 deaths in the 1st year of prohibition, and 27 deaths in 1922. The Health Department statistics show 187 deaths from alcoholism in 1917, 46 in 1920 and 155 in 1922. During the first 9 months of 1923 there were as many deaths as in the whole of 1922, according to figures given daily in the newspapers as a part of their campaign against moonshine poisoning. It appears,

concludes Gerty, that the alcoholism mortality has reached pre-war figures.

K. H. Krabbe (Med. Jour. and Rec., May 7, 1924) describes the success obtained in Denmark in reducing chronic alcoholism by heavy taxation of strong liquors so that their retail price was at first doubled and soon after increased 15-fold. As a result, the number of cases of delirium tremens admitted in the Copenhagen municipal hospital decreased from an average of 321 cases a year in the period 1903-1916 to one of only 15 cases a year in the period 1918-1921. The law came in force in March, 1917, and a perpendicular drop in the number of cases occurred in April. The writer believes that a good principle has been followed in Denmark concerning alcohol legislation. Without prohibition, delirium tremens has been cut down 95 per cent. While possibly absolute prohibition would have had the same effect, the impression from the neighboring countries, Norway and Finland, which have prohibition, seems less good. In Denmark homebrewing and physicians' prescriptions for whiskey are rare.

TREATMENT.—Inhalation carbon dioxide was found an effective remedy by F. T. Hunter and S. G. Mudd (Boston Med. and Surg. Jour., June 5, 1924) in 4 cases of acute alcoholic intoxication, rapid revival from coma taking place. The action is produced through an increase of pulmonary ventilation, this, in turn, accelerating elimination of alcohol through the lungs. Lesser degrees of intoxication did not show such striking improvement. The apparatus used consists of a tank of carbon dioxide, a reducing valve, a water bottle to regulate the gas flow, and an open slot mask providing for admixture of the inspired air with a stream of carbon dioxide as well as the escape of the expired air containing alcohol vapor through the slot.

Shivering and muscular twitchings occurred during the treatment, probably because of rapid loss of heat through the lungs. The procedure is recommended for all cases of alcoholic coma. In *methyl alcohol* poisoning it should be even more effective on account of the higher partial pressure of this compound as compared to ethyl alcohol.

Discussing the treatment of alcoholism at the Norwood Sanatorium, Francis Hare (Practitioner, Oct., 1924) states that tonics and injections of strychnine and atropine are reserved for patients who are abstaining on admission to the institution or have finished their "tapering" process. The injections consist of solutions of strychnine nitrate, 4 grains (0.25 Gm.), and of atropine sulphate, 1 grain (0.06 Gm.) to the ounce (30 c.c.). In the 1st week the dosage is gradually raised from the minimum of 2 minims (0.12 c.c.) of strychnine solution and 1 minim (0.06 c.c.) of atropine solution to 5 minims (0.3) c.c.) and 4 minims (0.25 c.c.), respectively. This is maintained for 3 or 4 weeks or more, after which there is a gradual reduction to the original amounts, upon the day of discharge. Under the drugs the majority of alcoholics evince no desire for alcohol. While in the sanatorium the patients learn that for them there is no hope of anything short of permanent total abstinence. Preventive treatment of delirium tremens may be regarded as the curative treatment of acquired tolerance of alcohol. The degree of tolerance of alcohol without intoxication having been ascertained from the patient or by giving enough alcohol to check muscular tremor, the patient is usually given on the 1st day the minimum amount required to keep him entirely comfortable. Then 2 ounces (60 c.c.) are subtracted regularly every 24 hours. The tapering is thus nearly always completed in 8 to 10 days. Sodium bromide in ½ dram (2 Gm.) doses is advisable, but barbital or paraldehyde are seldom needed. vomiting is best treated by repeated gastric lavage with several pints of warm water alkalinized with sodium bicarbonate, this solution to be retained until the organ is slightly distended, and then emesis encouraged. Apomorphine hydrochloride in 1:200 solution hypodermically is of great value in mania a potu, during the premonitory stage of dipsomania or the actual paroxysm, and in the several forms of insomnia. In maniacal drunkenness, the effect of 20 minims (1.25) c.c.) of the solution is very striking. In dipsomania apomorphine stills the craving much more quickly than strychnine and atropine, but frequent repetition is required; 5 minims (0.3 c.c.) may have to be repeated several times daily. For inability to go to sleep or to remain asleep, doses of 4 to 8 minims (0.25 to 0.5 c.c.) are extremely useful. The drug is not habit-forming. The craving for alcohol ceases 3 or 4 days after conclusion of the tapering, but may return occasionally for several weeks more, during which the patient should remain in the sanatorium; the entire course of treatment thus occupies 6 to 8 weeks.

By the mouth, in frequent small doses, Stanford Park (Lancet, Sept. 6, 1924) has found all of the following extremely useful: Tincture of nux vomica, 1 to 3 minims (0.06 to 0.2 c.c.); tincture of kola, 10 minims

(0.6 c.c.); compound tincture of cinchona, 10 minims; fluidextract of damiana, 10 minims; concentrated compound infusion of gentian, 12 minims (0.75 c.c.). These are best given with fluidextract of licorice, 5 to 10 minims (0.3 to 0.6 c.c.) in a teaspoonful of water every 2 hours from 8 a.m. to 8 p.m. Ambulatory treatment nearly always fails and institutional treatment, preferably in a small institution, is essential.

THERAPEUTICS.—Sir Humphry Rolleston (Pract., Oct., 1924), in acute disease, regards alcohol as mainly of value in an emergency and as a temporary remedy, e.g., at the crisis of pneumonia to stimulate the heart or occasionally to induce sleep. The cardiac effect is immediate and reflex from the gastric mucosa, but is temporary only, being followed by depression of cardiac power. In convalescence from acute disease, when gastric secretion and motility are impaired, as well as in the "tired stomach" of overworked and aging individuals, addition of brandy or whisky to the meals may make all the difference between distaste for meals and painful digestion, and ability both to eat and assimilate food. The good effect is due partly to the contained ethers in brandy and wines; hence age improves the effect of these beverages. The amount taken at any 1 meal should be small. In flatulence a small dose of old brandy or a liqueur may act like a charm in relieving the "windy spasm." In gastric carcinoma alcohol, although it does not increase secretion, does good by diminishing pain, fermentation and eructations and by creating a feeling of better being. For the reflex cardiac stimulation in sudden heart failure and threatened syncope, ether is equally as effective as alcohol and has the advantages of greater volatility and of less after-depression of the heart.

As a disinfectant for surgical use De Gaetano (Policlin., Jan. 30, 1922) particularly recommends 70 per cent. alcohol to which 1 per cent. of acetic acid has been added.

According to D. H. Grant (Jour. of Lab. and Clin. Med., Mar., 1923), isopropyl alcohol is suitable as a lotion or vehicle for external medication and as a constituent of mouth washes, gargles, dentifrices, etc., which do not involve the probability of swallowing more than a few cubic centimeters, at most, of the alcohol. Its toxicity is between once and twice that of ethyl alcohol.

In a case reported by L. F. Love (Amer. Jour. of Ophth., Mar., 1923) 95 per cent. alcohol was used to dissolve out deposits of cholesterin and lime salts in the cornea. The epithelium, Bowman's membrane and the deeper tissues covering the cholesterin were first picked off with a needle. After application of the alcohol a diffuse milky appearance at first resulted, but by the next day absorption had occurred and a bright, clear cornea remained.

MOONSHINE LIQUORS AND METHYL ALCOHOL.—The illicit liquors now frequently consumed result in an aberrant type of alcoholism popularly known as moonshine poisoning. Besides the true moonshine liquors, beverages containing toxic substances include wood alcohol, denatured alcohol, synthetic gin, toilet waters, tincture of ginger, etc. Moonshine poisoning is not dependent on the presence of methyl alcohol in

the beverages taken, but, as pointed out by F. J. Gerty (Ill. Med. Jour., Aug., 1924), on a high content of aldehydes, particularly acetaldehyde -a rapid intoxicant inducing profound stupor and deleterious aftereffects. This high aldehyde content is the result of poor control of fermentation, faulty distilling methods and lack of aging. Contrary to popular belief, fusel oil and the higher alcohols are not responsible for the high toxicity. These substances are contained also in old whiskey, but the aldehydes have become detoxicated by polymerization.

From experience at the Cook County and Psychopathic Hospitals, Chicago, Gerty concludes that practically all alcoholism now encountered clinically is of the "moonshine" type. The poison takes effect more rapidly than in ordinary alcohol poisoning, and a smaller amount of the prevalent beverages is required to incapacitate. The effect is more profound and more often fatal. At the Psychopathic Hospital a deep coma is often seen, with the temperature usually subnormal, breathing slow, the body covered with perspiration and the face cyanotic. Deep coma lasting over 5 hours, or with rapid respiration and moist râles heard over the whole chest, is an unfavorable omen. Maniacal excitement is frequently seen, many patients coming to the hospital badly bruised and with broken ribs. Unless they can be quieted exhaustion occurs. Clearcut delirium tremens is less common than formerly. Toxic jaundice and epileptiform convulsions have been seen and are bad prognostic signs. On the mental side, neither the disorientation nor the hallucinations are

quite typical; deteriorated intelligence is a common sequel, as it is likewise in alcoholic hallucinosis, which is commoner than delirium tremens and rather atypical. Korsakoff's psychosis is met with about as often as formerly.

The diagnosis of chronic alcoholism with mental deterioration is made more commonly than ever before. This deterioration may be simple or delusional. The "pseudoparetic" and paranoid types are fairly common. The mental clinical condition, however, is usually blurred and less easily classified than in ordinary alcoholism. A salient feature is the rapid onset of mental deterioration, which is almost the rule after but 1 or 2 sprees. Multiple neuritis is less frequent than might be expected. The commonest change in the eyeground is sclerosis of the arteries. Albuminuria is frequent, but usually slight. There are no pathologic findings pathognomonic of moonshine poison-Serous meningitis proved almost constant; liver changes were quite usual, while renal changes were less common than had been expected. Pneumonia is less frequent than formerly, and cirrhosis is uncommon, probably because the rapid poisoning of the higher nerve centers and earlier fatal termination give it no time in which to develop.

In regard to blindness due to methyl alcohol, J. M. Downing (Jour. Iowa State Med. Soc., Nov., 1922) notes that such blindness may occur not only after acute intoxication but through the cumulative effects of small amounts. In the former instance, no disturbance of sight may be noticed at first, but several hours later severe gastrointestinal symp-

toms may appear, together with rapid failure of vision. This may proceed to complete blindness, and pronounced pupillary dilatation may occur; usually, however, marked improvement of vision takes place for several days, after which visual failure sets in again and ends in permanent blindness. In this second stage treatment is of no avail. The early treatment consists of gastric lavage continued for days, sweating with Turkish baths or pilocarpine, venesection, alkalies, and in severe cases, lumbar puncture.

ALKALOSIS.—Alkalosis, i.e., the condition in which the acid-base balance of the blood is shifted from the normal definitely to the alkaline side, is believed by L. Kast, V. C. Myers and H. W. Schmitz (Jour. Amer. Med. Assoc., June 7, 1924) to be much more common than is generally Clinical conditions that may lead to it are: (1) Use of sodium bicarbonate; (2) pyloric obstruction (through the loss of hydrochloric acid by vomiting); (3) fever (through pulmonary overventilation, causing increased excretion of CO2 and disturbance of the NaHCO3: H<sub>2</sub>CO<sub>3</sub> ratio); (4) deep X-ray therapy. The clinical symptoms of alkalosis are easily overlooked: Headache, lassitude, nausea, vomiting, fever and, in some severe cases, tetany. It is difficult to alleviate, acid sodium phosphate, hydrochloric acid and blood-letting not being comparable in efficacy to sodium bicarbonate in acidosis. In 20 cases of uncompensated alkalosis tabulated by the writers, the relative frequency of the 4 above-mentioned causes appeared to be as follows: 10, 6 (vomiting), 3 and 1. The cause cannot always be definitely given because alkalosis may be accompanied by vomiting and fever, which in themselves lead to alkalosis. Among the causes of vomiting other than pyloric obstruction were cyclic vomiting, intestinal obstruction, gastric cancer (postoperative vomiting), and duodenal ul-Kidneys that do not readily eliminate alkali favor alkalosis from bicarbonate administration. The urine may remain strongly acid despite the presence of alkalosis. Ketosis is not necessarily incompatible with alkalosis. A number of the cases showed symptoms of tetany, but the evidence that the tetany is a direct result of the alkalosis appears to the writers inconclusive. As the clinical signs of alkalosis are not unmistakable, they recommend laboratory methods, viz., determination of both the blood bicarbonate and the hydrogen ion concentration (pH) of the blood, for reliable information as to the acid-base balance. They regard a hydrogen ion concentration above 7.47 as definitely abnormal.

The symptoms of alkalemia from overdosing with sodium bicarbonate are given by A. W. E. Ellis (Quart. Jour. of Med., July, 1924) thus: Undue introspection and nervousness; headache, nausea and vomiting, dizziness and lightheadedness; weakness ending in absolute prostration; apathy and drowsiness; finally tetany and convulsions. Such an uncompensated alkalemia occurs where the compensating retention of CO2 fails and the pH of the blood rises. The symptoms of alkalemia resemble those of anoxemia, and this is probably their real explanation. In 1 case rectal administration of 16 Gm. (1/2 ounce) of ammonium chloride proved to be effective treatment.

Aside from the probable anoxemia with its general ill-effects, J. B. Youmans and I. W. Greene (Jour. Mich. State Med. Soc., Apr., 1924) refer, in connection with gastric disease, to the risk of increasing alkalosis by gastric lavage, thus bringing on tetany. There is also a possibility that alkalosis may adversely affect the surgical risk. The treatment of alkalosis in gastric disease is to check the vomiting. In the milder cases rest and restriction of food are sufficient; in more severe cases surgical intervention is frequently required.

ALKAPTONURIA.—According to L. Vohtz (Hospitalstid., Feb. 20, 1924), the total number of cases of alkaptonuria recorded in the literature is 111, including his own. In the treatment he advocates restriction of proteins, particularly casein. Precautions against injury to the joints are necessary. Since potassium iodide diminishes the output of homogentisinic acid, this drug may be worth trying where arthritis occurs.

ALLONAL.—This drug, classed as a non-narcotic hypnoanalgesic, is a combination of a new hypnotic, allyl-isopropylbarbituric acid, and the analgesic amidopyrin (phenyldimethyl-dimethylamino-pyrazolon), in the ratio of 1:1%. It occurs as a yellowish powder, slightly soluble in water, easily soluble in alcohol, with a bitter taste. It is generally given in tablets, each containing 2% grains (0.173 Gm.). The dose ranges from 1 to 8 tablets—2% to 21% grains (0.173 to 1.38 Gm.).

Clinical reports seem to indicate it to be a relatively safe drug combining hypnotic and analgesic properties. According to S. Kuh and F. J. Gerty (Ther. Gaz., Apr., 1923), who used it in insomnia with or without pain in a variety of disorders, such

as alcoholism, dementia præcox, drug addiction, paresis and neuralgias, it is more effective in cases with restlessness and sleeplessness due either to pain or to psychosis. In the more violently disturbed cases it is probably less effective than morphine and hyoscine, but is less dangerous. Single doses up to 20 grains are safe, and after-effects are few. Depression of vital functions was not observed in any case.

M. A. Burns (Med. Jour. and Rec., Jan. 16, 1924) gives the indications for it as ranging from those of an ambulatory sedative to the induction of prolonged sleep, without narcosis, for the alleviation of pain. He has found it useful in hemiplegia with insomnia, tabetic pains, cerebrospinal syphilis, multiple neuritis, rheumatoid arthritis, melancholia with drug addiction, and postoperative dental pain. In a case of morphinism with daily consumption of 4 grains of morphine sulphate, the latter was abruptly withdrawn with success by the substitution of 13 grains (0.84 Gm.) of allonal a day for several weeks, followed by gradual reduction to nothing. In a case of paralysis agitans with refractory nocturnal pains in the extremities, 10 grains (0.6 Gm.) of allonal, later gradually reduced to 5 grains (0.3 Gm.), afforded the patient comfortable nights, although morphine had given only partial relief. The drug is now used by the writer as a routine measure in tabetic pains, and in agitated depression good results were obtained from 2% grains after each meal and 5 grains at bedtime during the agitated stage. No development of increased tolerance of the drug in chronic cases was observed. Vertigo may occur following over-dosage in ambulatory cases. The writer quotes C. S. Potts as having found the drug effective in persistent hiccough. G. F. Phelps, among other uses, found it of value during the menstrual periods, beginning its administration 3 days before time. B. F. Weiss gave 10 grains every 3 hours for the relief of dysmenorrhea with neurotic symptoms, and also found it useful in Hodgkin's disease with pressure pain in superficial nerve trunks. S. F. Gilpin found 10 grains effective in refractory nocturnal pain in syphilitic headache and brachial neuritis.

ALOPECIA.—ETIOLOGY.—In view of the fact that baldness is practically limited to the male sex and involves only a portion of the scalp, R. O. Stein (Wien. klin. Woch., Jan. 3, 1924) opposes the theory that it is of seborrheic origin, since seborrhea occurs in both sexes and involves the entire scalp. He thinks baldness should, instead, be regarded as a male secondary sex character operating on a seborrheic soil. After puberty in males there occurs normally a falling out of the hair on either side of the forehead; this is a secondary sex character, as is also loss of hair in the parietal region, when it occurs. Some women with masculine characters, especially hypertrichosis, show these same peculiarities, whereas in eunuchoids the anterior hair line forms an even arc, as it does in children and normal women. Baldness in men is therefore to be regarded partly as an exaggerated secondary sex character.

An occupational form of alopecia has been described by Axmann (Deut. med. Woch., Apr. 18, 1924) as occurring in wireless operators. The electronic tube appears to act in some degree like an X-ray tube, and loss of hair occurs on the side of the head exposed to the apparatus for long periods in the course of the victim's work.

TREATMENT.—Careful adaptation of the treatment to the type of case seen is stressed by L. K. Mc-Cafferty (N. Y. Med. Jour., Oct. 4, 1922). A tonic indicated for one scalp may cause disastrous results when used for another. Tonics should be thoroughly rubbed into the scalp with rubber gloves for 10 or 15 minutes each night 5 or 6 times a

week. **Ointments** are also necessary in association with tonics, but should be used on different nights—usually but once a week, to be followed by washing with soap and a **shampoo** the next day. The following formulæ are serviceable in the different forms of alopecia:

# Dry Scalp. (Tonic.)

R Hydrarg. chlorid, corros. ...... gr. ij (0.13 Gm.); Resorcinol., Chloral. hydrat. ...āā 3j (4 Gm.); Spts. acid. formic. ... f3j (4 c.c.); Ol. amygd. express. f3iv (15 c.c.); Tr. quillaj., ..q.s. ut ft. emulsum; Aq. calcis, ...q.s. ad f3viij (240 c.c.).

M. Sig.: Apply to scalp 5 times a week and rub in thoroughly.

# Dry or Oily Scalp. (Ointment.)

M. Sig.: Apply once a week and follow with shampoo the next morning.

# Oily Scalp. (Tonic.)

R Hydrarg. chlorid. corros. ..... gr. ij (0.13 Gm.); Resorcinol.

Chloral. hydrat. ...āā 3j (4 Gm.); Tr. cantharid. ..... f3ss (2 c.c.);

Alcohol. .......... f3ss (15 c.c.); Aq. destill., ..q.s. ad f3viij (240 c.c.).

S. Sig.: Apply to the scalp 5 times a week.

### Dermatitis Seborrhæica. (Ointment.)

R Acid. salicyl. ...... gr. xv (1 Gm.); Sulphur. præcip. .... 3ss (2 Gm.); Petrolat. alb., .q.s. ad f3j (4 c.c.).

Ft. ung.

Sig.: Apply once or twice a week and follow with shampoo the next morning.

In the alopecia following infectious diseases the patient should be built up

generally and the scalp stimulated with tonics, ointments, massage and actinic therapy. Dermatitis seborrhæica, tending to spread from the scalp to the glabrous skin, with red or yellowish-red crescentic or serpiginous lesions covered with greasy yellow scales or crusts, quickly disappears under sulphur treatment but recurs unless the treatment is continued over a long period. The actinic rays of the Alpine or the Kromayer lamp are beneficial in many obstinate cases of alopecia, especially those following infectious diseases. The high frequency machine, used 2 or 3 times a week to produce an crythema, is of some value.

The hair, unless extremely brittle and dry, should be brushed daily for 10 minutes. The comb and brush should be washed thoroughly every 10 days and dried in the sun. No hair dyes should be used, unless scientifically prepared. One dram (4 Gm.) of sage and sulphur may be incorporated in a hair tonic and will color gray as well as the unchanged hairs a dark brown without any untoward The scalp should not be washed oftener than twice a week, and if dry, not more than once in 10 days. Massaging, at least twice a week, is excellent in anemic scalps. Alopecia can usually be arrested and occasionally benefited to the point of stimulating dormant hair follicles; but the patients must be prepared to spend at least 6 months or more in conscientious treatment.

ALOPECIA AREATA.—In 99 out of 100 cases of alopecia areata examined by H. Orr (Brit. Jour. of Derm. and Syph., Feb., 1924) for evidences of syphilis there were no clinical

indications of the disease, and the history and Wassermann reaction were negative. In 1 case in a boy of 13 years, there was a persistently positive Wassermann and a recent patch of alopecia, which disappeared after 4 intravenous injections of neoarsphenamin. The writer does not feel that alopecia areata in syphilitic subjects is actually due to the syphilitic infection.

Studying the basal metabolism in 25 cases of alopecia areata, Lévy-Franckel and Juster (Bull. méd., Jan. 26, 1924) found it abnormally high in 18 and abnormally low in 5. On this basis the cases with increased metabolism were treated by X-ray exposure of the thyroid gland or serum from thyroid-ectomized animals, with successful results after all other procedures had failed.

Ultra-violet rays furnished by the quartz lamp were used with success in 2 cases by de Bárcena Verdú (Rev. españ. de urol. y derm., Mar., 1924). The procedure recommended involves exposures at decreasing focal distances—60 to 25 centimeters—and of increasing duration—15 to 60 minutes.

ALTITUDE.—According to Judson Daland (Internat. Clin., 4, 124, 1923), the stimulating influence of altitude on the cells of the bone-marrow producing hemoglobin and erythrocytes is beneficial to convalescents from most diseases, including those suffering from systemic manifestations of chronic focal infection after the focus or foci have been removed. It acts favorably in simple anemia and in ill health from general causes, such as overwork. Certain patients with cardiovascular or pleuropulmonary disease may be benefited by moving slowly from a low to a high altitude; in serious cases, however, death may result if the change is too rapid. Growth is greatly stimulated by altitude, especially in the young.

Amaurosis

AMAUROSIS.—In a malarial case reported by M. M. Amat (Siglo méd., May 5, 1923), quinine to the amount of 1 Gm. (15 grains) daily for 5 days is stated to have caused amaurosis in 1 eye and amblyopia in the other. Gradual improvement of vision was observed, but even 3 months later vision was but 1/2 in each eye and the papillæ remained rather pale. The treatment given in this case consisted of sodium iodide, 5 Gm. (75 grains), and potassium nitrite, 3 Gm. (45 grains), in 30 Gm. (1 ounce) of syrup of ether and 120 c.c. (4 ounces) of water. Three teaspoonfuls of this were given daily for 2 weeks, after which strychnine injections were administered. Digitalis is also indicated. Prompt treatment should be given when eye disturbance is noted under quinine.

That blindness due to methyl alcohol may be simulated by disease of the brain tissues was illustrated in a case of thrombotic cortical amaurosis recorded by H. Mella (Jour. of Nerv. and Ment. Dis., Dec., 1922). The patient was a man of 52 years admitted for blindness and loss of memory. Two drinks of whiskey had been immediately followed by severe gastroenteritis and the visual failure. Wood alcohol intoxication was suspected, but when the case died later of bronchopneumonia, sclerotic changes in the brain plainly accounting for the amaurosis were discovered. There was softening and shrinkage of the tips and lower surfaces of the occipital lobes, and also large cysts of softening and degeneration in the white substance in the optic radiations. The brain was normal aside from the marked arteriosclerotic changes.

Amaurosis the result of hemorrhage was observed in the case of a woman of 52 years reported by O. Retzlaff (Zentr. f. Gyn., Sept. 15, 1923). Severe, protracted bleeding from the uterus during the menopause resulted in blindness in both eyes.

An even more unusual case is that of R. A. Izzo (Rev. de la Asoc. méd. Argent., Oct., 1923), in which amaurosis occurred as the needle was being withdrawn after the patient's 14th insufflation of gas for artificial pneumothorax. With the blindness were noted loss of pupillary light reflex and marked lacrymation and headache. Injection of 0.01 Gm. (1/6 grain) of morphine was followed by complete restoration of vision in 20 minutes. The amaurosis is assumed to have been reflex. Preliminary injections of morphine and procaine to ward off reflex effects should regularly be given before pneumothorax, even where, as in this case, the patient appears to have attained complete tolerance of the procedure.

AMBARD CONSTANT.—That Ambard's urea coefficient is superior to all other measures of renal function in that it gives a definite numerical expression of such function rather than approximate findings such as "good," "fair" or "poor" is maintained by H. Chabanier, C. Lobo-Onell and M. Lebert (Paris méd., Aug. 4, 1923). Thus, given a case with a coefficient of 0.140, dividing this by the normal coefficient (0.070) gives 2, squaring this gives 4, and dividing the normal renal function (taken as 1) by the latter gives 0.25, which means that the functional value of the kidneys where the coefficient is 0.140 is 25 per cent. of the normal. From determination of the coefficient before and after an operation of unknown nature the technician could, e.g., definitely assert that the operation had been a nephrectomy. Legueu has recently made use of the coefficient to establish the indications for

nephrectomy in doubtful cases in which other procedures have not supplied definite information. Thus, if, in a case of renal tuberculosis without definite localizing indications, the coefficient is below 0.100, the remaining functional capacity of the kidneys is known to be over 50 per cent. of normal, and if, upon operative exploration, a kidney is found with very marked tuberculous disease, it can be definitely assumed that the remaining 50 per cent. of renal function are possessed wholly by the opposite kidney, which is thus known to be normal or almost normal. E. Teposu (Jour. d'urol., Mar., 1924) reports 2 cases in which the coefficient proved the only reliable guide to nephrectomy for tuberculous and cystic kidney, respectively. Prompt recovery followed nephrectomy based on the favorable coefficient, although all other procedures had indicated that the cases were inoperable.

On the basis of studies of the Ambard constant in high blood-pressure cases, C. Aubertin and E. Rigal (Bull. Soc. méd. des hôp. de Paris, July 24, 1924) assert that in many high pressure cases the renal function is quite normal as to urea excretion and remains so for years. The blood nitrogen being normal in 34 of these patients, the Ambard constant has generally to be resorted to for a renal prognosis. If the constant is normal, laxity as regards proteins in the diet is permissible, experience showing that a meat diet is often borne for a very long time without renal manifestations. If, however, the constant is high, and especially if it goes up after being low, an unfavorable prognosis must be rendered in spite of the institution of a stringent low-protein diet.

AMBLYOPIA.—The toxic amblyopias due to nicotine and alcohol, arsenic, carbon disulphide, iodoform and diabetes are featured by a central scotoma and inability to distinguish colors. As noted by G. de Andrade (Brazil-med., Sept. 8, 1923), these amblyopias set in insidiously, and the unsuspected color-blindness may result in serious errors by workers in certain lines. One of his cases was a bookkeeper sitting in a poorly ventilated room in a tobacco factory, with the air laden with tobacco fumes. Elsewhere, several workmen with impaired vision were found to be exposed to carbon disulphide; relief was obtained merely by improving the ventilation in their working quarters. E. Adrogué (Semana med., Aug. 16, 1923) observed 48 cases of amblyopia from axial neuritis the result of smoking cigars made of imperfectly dried tobacco. At first there was a paracentral, then a central scotoma. Although potassium iodide sometimes appeared to benefit, a small paracentral scotoma usually remained in spite of treatment.

> For the detection of the central scotoma in toxic (especially nicotinealcohol) amblyopia, F. Terrien (Méd., Jan., 1924) uses a piece of paper 2 to 3 millimeters square, white on 1 side and green on the other. With the patient fixing the white side, the paper is turned over; where scotoma exists he fails to notice the green color. If the condition is severe. neither green or red colors nor the white paper itself are recognized.

In a case reported by J. N. Evans (Amer. Jour. of Ophth., Apr., 1923), 100 grains (6½ Gm.) of quinine sulphate had been taken after ingestion of a large amount of whiskey. The case was peculiar in the absence of customary symptoms such as tinnitus, deafness, vomiting and diarrhea, but 13 hours after ingestion of the quinine vision became very dim. Three months later narrowing of the retinal arteries and other fundal changes, with concentric contraction of the visual fields, were still present.

Chemically allied to quinine is cthylhydrocuprcine, which, under the trade designation optochin, has been tried in pneumonia, sometimes with disastrous effects on vision. According to G. Abelsdorff (Deut. med. Woch., June 15, 1923), combined injury to the optic nerve, retina and chorioid sometimes features this form of amblyopia. In a case he reports, which had received 3 doses of 0.25 Gm. (4 grains) of optochin for pneumonia in 1914, vision 9 years later was still \%20 and \%35, with pale papillæ, narrowed vessels, and white areas in the retina traversed by sclerosed vessels. There was also hemeralopia, contraction of the visual field and paracentral scotoma, and disturbed color vision.

In hysteric amblyopia the usual manifestations are reduction of visual acuity and concentric contraction of the visual fields. In 2 cases reported by P. Gaudissart (Ann. d'ocul., May, 1923) certain additional features of interest were presented. One patient, a woman of 22 years, showed absolute central scotomas. Placing neutral lenses before the eyes, along with suggestion, regularly increased visual acuity from  $\frac{1}{8}$  to  $\frac{2}{3}$ . The other case, in a woman of 29, displayed marked photophobia and loss of sensitiveness of the bulbar conjunctivæ, although sensation of the cornea and lids was retained. Whereas each eye individually could barely count fingers at 3 meters, binocular visual acuity was 1/6. If, thereupon, vision of 1 eye was cut off, without the patient's suspecting it, by means of a strong convex lens, vision in the other eye unexpectedly dropped to the counting of fingers at 3 meters.

**AMENORRHEA.**—According to B. Aschner (Wien. klin. Woch., Dec.

27, 1923) there are 5 types of women in whom amenorrhea is most likely to occur: (1) The anemic and chlorotic; (2) the plethoric, benefited by venesection but sometimes unfavorably affected by iron and arsenic; (3) the hypoplastic (universal or partial hypoplasia); (4) the obese, and (5) those with hypertrichosis, even of slight degree. In some obese cases, induction of regular menstruation by venesection and local measures was followed by subsidence of the obesity; on the other hand, some obese patients are relieved of their amenorrhea after the obesity has been reduced.

Discussing the endocrin treatment of the amenorrhea of *puberty*, G. Y. Oliver (Med. Jour. and Rec., June 4, 1924) gives a synoptic table of features differentiating 3 forms of the disturbances, ascribed to endocrin deficiencies [see p. 80].

In the treatment of such cases, aside from the administration of the organ particularly deemed deficient, viz., ovarian extract, thyroid gland or whole pituitary, the writer favors the use of pluriglandular preparations such as hormotone, in the belief that they reinforce the action of the single gland substance.

To stimulate the utero-ovarian functions in cases of *primary* amenorrhea due to endocrin deficiency, A. Fornero (Actinoter., Jan., 1924) advocates very mild **X-ray irradiation of** the uterus, employing a dosage only ½0 to ½ that ordinarily applied over the ovaries. In 4 such cases between the ages of 15 to 20 years, menstruation was thus established after from 3 to 6 exposures at intervals of 11 to 15 days. Similar results were obtained in 3 cases of secondary amen-

DISTURBANCES ASCRIBED TO ENDOCRIN DEFICIENCIES.

	Hypo-ovarism	Hypothyroid	Hypoanterior Pituitary
Eyebrows	Normal	Loss of outer third	Normal
Teeth	Normal	Lower teeth crowded	Space between teeth
Height	Excessive	Medium	Tall
Muscles	Poorly developed	Flabby	Well developed
Span	Greater than height	Equal to height	Greater than height
Fat	Very thin	Plump	Plump
Breasts	Rudimentary	Normal	Normal
Hips	Large pelvis	Normal female	Normal female
First period	Absent	Late, 16 (If hyper, early, 13)	Late, 16 to 18
Loss	Absent	Scanty (If hyper, excessive)	Scanty Green in color
Interval	Absent	Four weeks-months	Four weeks-months
Blood-pressure	90 to 110	100 to 120	110 to 130
Pulse rate	72 to 80	60 to 70	80 to 90
Blood sugar	.09	.07 to .06	.1 to .14
Metabolic rate	?	<b>−4</b> to <b>−10</b>	<b>−4</b> to <b>−10</b>

orrhea. Restriction of the exposures to the uterus is deemed advantageous in eliminating all risk of injury to the ovaries without interfering with the desired therapeutic results.

In amenorrhea attending syphilitic and gonorrheal infection, B. Spiethoff (Münch. med. Woch., June 6, 1924) resorted to X-ray irradiation of the spleen. Restoration of menstruation was obtained in girls who had already menstruated, but no result where the function had not yet been established.

AMPUTATIONS.—As a result of war experience it became clear that certain forms of amputations described in text-books were not actually suitable for practical purposes. Thus, Sir William I. de C. Wheeler (Surg., Gyn. and Obst., July, 1924) refers to the almost complete lack of utility of the Lisfranc, Chopart, Roux, Farabeuf and Teale operations, and the fact that in the Stokes and Gritti operations the retention of the patella proves a handicap to the limb maker.

Syme's operation is improved by dividing the tibia and fibula at a higher level. Amputations through the knee joint are generally considered undesirable, and amputation at the hip is best performed with the skin flaps cut very short and the femoral head left behind in the acetabulum. Operations less than 3 inches above or below the knee or elbow joints are avoided. Corner is quoted as specifying the following amputations as remaining available for use in the lower extremity: (1) Amputation of the toes; (2) Syme's amputation; (3) leg amputation with skin flaps; (4) thigh amputation with long anterior and short posterior flaps; (5) amputation through the neck of the femur with skin flaps. For use in the upper extremity there remain: (1) Amputation of the fingers; (2) forearm amputation with equal skin flaps; (3) circular amputation of the upper arm; (4) Spence's amputation at the shoulder.

As a method of performing certain emergency operations with the least

possible surgical risk and conservation of the longest possible stump, Wheeler describes the sleeve operation, suited particularly for cases of complicated fracture of the femur that are bad surgical risks. The word "sleeve" has reference to the thigh as it remains after withdrawal from it of the lower fragment of the femur, presenting the appearance of a coatsleeve from which the hand and forearm have been removed. The orthodox method of obtaining healthy flaps well above the injury or disease is departed from, yet excellent results are obtained. One of the 3 illustrative cases described is that of a man run over by a truck, with fracture at the middle of the femoral shaft. When seen, the limb was gangrenous nearly to the knee, the thigh was enormously swollen and seemed in the early stages of moist gangrene, and edema, vesication and discoloration extended upward on the abdomen. The femoral artery in its upper portion was exposed by incision and compressed by an assistant between finger and thumb. A circular amputation was quickly performed through the knee joint, just above the line of definite gangrene, and the lower fragment of the femur detached from the soft tissues and withdrawn by rotary movements. Upon release of the femoral artery there was no bleeding at the end of the stump, showing that at this level the vessels were thrombosed. The cavity was left open, lightly packed with iodoform gauze, and uninterrupted recovery followed, except for a sloughing of the skin in the upper portion of the thigh. When seen 7 years later the patient was walking without discomfort with an artificial leg. There was

no tendency to abduction or flexion of the stump. Similar results were obtained in a case of ununited compound gunshot fracture of the thigh with the upper portion of the thigh riddled with sinuses, and in a boy with osteomyelitis of the femur, pathologic fracture following an attempt at radical cure, many sinuses, and very poor general condition. these cases the amputation was done below or through, instead of above, the area of septic infection, but recovery was nonetheless rapid. The shock of the procedure is reduced in that there is no division of bone with the saw. The operation is applicable to any position in the upper or lower limb. The writer endorses the form of amputation of the leg recommended by Orr for cases with severe injuries or advanced disease where Syme's operation cannot be performed [Orr's procedure was described in the preceding Supplement, pp. 68-69].

The following suggestions to the practising surgeon as regards the choice of the site of amputation are given by H. A. Albrecht (Verh. d. Russ. Chir. Pirogoff-Ges., 1922; Surg., Gyn. and Obst., July, 1923) on the basis of many thousands of amputations: Except in the upper extremity, it is necessary to abandon the principle of amputating as far distally as possible. Elsewhere, easy and satisfactory prosthesis should be the prime consideration. No foot amputation below the malleoli can ever give the effect secured by amputation below the knee. Disarticulation at the large joints should be abandoned, proving a lasting source of discomfort and making prosthesis more difficult. In leg amputations at the site of election

active, free and vigorous movements of the stump should be maintained, or, if one cannot make certain of this, the bent knee used as support for the prosthesis from the start or the Gritti amputation selected. In amputation of the thigh in the proximal third, either a well covered stump 18 to 20 centimeters in length should be secured, or the incision made high up under the lesser trochanter and the prosthesis then proceeded with as after a disarticulation. At the elbow a supracondylar amputation of the humerus is to be preferred to preservation of the joint. Laroyenne and Comte (Lyon chir., Nov.-Dec., 1923), however, favor the attempt to do without a leg amputation where a Syme or Roux operation is not feasible on account of lack of plantar tissues, by the use of Baudens's method, in which the foot is disarticulated and a dorsal flap formed. In 2 cases dealt with in this way satisfactory results were obtained.

For the assistance of the operator in amputation of the *thigh*, R. Finochietto (Semana méd., Feb. 15, 1923) has looped around the member a sheet folded to make a band about 20 cm. (8 inches) wide. The stump is thereby pulled up to the erect position by the anesthetist, thus facilitating the surgeon's further manipulations of it.

Another helpful device is described by E. N. Turkus (Med. Jour. and Rec., Aug. 20, 1924), consisting of a new form of retractor to hold the soft parts away from the end of the bone while the periosteum is being peeled back. The 2 rounded and concave blades of the instrument are hinged together, and when closed form a shallow cup with a central opening through which the bone (usually femur or humerus) protrudes. Loop handles are provided

with which the assistant effects the necessary retraction while at the same time steadying the limb with his hands. The device protects the soft parts and the assistant's hands from injury by the saw, reduces the number of assistants required to 1, and eliminates the use of towels, in the meshes of which the saw is apt to become caught.

In a case of double amputation of the legs reported by J. L. Crook (Tenn. State Med. Assoc. Jour., May, 1924), the operative work was done by 2 surgeons simultaneously in order to reduce the time on the operating table, the patient's general condition being poor. The immediate results were good. Collapse occurred the next morning, but upon intravenous administration of 5 pints (2½ liters) of physiologic salt solution improvement took place and recovery followed.

Kineplastic Amputations.—In a general review of the technic of this type of amputation, G. Bosch Arana (Presse méd., Dec. 12, 1923) notes that the 2 basic types of plastic motors that may be produced are the loop and the club. The former is the more satisfactory, and is made by uniting tendons or muscles to form an open space or "eye" into which, after epidermization, may be passed a hook connected with a prosthetic apparatus. It is possible to prepare 2 and even 3 motors from a single stump, thus increasing the variety of movements which the patient may perform. Usually it is better to prepare a loop with the tendons of 2 powerful muscles and resect the others at the level of section of the bone than, e.g., to attempt in a forearm amputation to unite all the flexor tendons with the extensors; this makes it easier to obtain a proper skin covering of the loop.

While it is possible to change the functions of muscles by motor education, it is always best to use as motor a muscle having naturally the same function as that required of it in the prosthesis. The motor is connected with the moving parts of the prosthetic apparatus by a tractor provided with a screw device with which the tension of the muscles can be regulated by the patient to obtain the best working results. The value of a few weeks of exercising of the muscles in increasing the amplitude and force of motion with the apparatus was plainly seen in several of the writer's cases. Some little meditation and recollection on the part of the patient is required to recover power over muscles long unused when kinematization of an old stump is attempted. Massage and electricity are employed in the immediate postoperative treatment. Illustrations are presented of the favorable functional results obtained in amputations of the arm, forearm and leg.

> In another contribution, Bosch Arana, D. del Valle and F. Wildermuth (Surg., Gyn. and Obst., Apr., 1923) have shown how certain drawbacks in the mechanism of the forearm prosthesis can be overcome. With a motor situated on the anterior surface of the elbow, a difficulty had arisen in that objects gripped in the artificial hand were dropped when the forearm was flexed on the arm, owing to the fact that the distance between the hand and the motor was shortened during such flexion. This defect was corrected by the addition of a stiff rod which propels the hand distally as the forearm is flexed, thus gaining the distance required to keep the motor taut. In a case provided with this improved de

vice, the power developed by the motor amounted to 15 kilograms over an excursion of 4 centimeters. The length of forearm remaining was the minimum, viz., 9 centimeters, and the motor was constructed with the supinator and pronator teres muscles. The patient had a double amputation, but with the apparatus on each side was enabled to feed himself, do many other things necessary in his personal care, and resume many of his usual habits. The writers maintain that kineplastic amputation has now won an indisputable place in surgery.

Several additional contributions have appeared on the Putti forceps or radioulnar cleft method of kineplastic amputation, in which after removal of the hand and a portion of the forearm, a long cleft in the remaining forearm is made by which objects, such as a spoon, can be grasped, and muscular power exerted by rotation of the parts. Putti (Chir. d. Org. di Mov., Jan. 1923), among others, reports the case of a young woman whose forearm had been amputated on account of tuberculous disease and the method gave results exceeding anticipations. He states that in many such cases the force available is sufficient to operate the fingers of an artificial hand.

The Amputation Stump.—That the results of war amputations, as regards the weight-bearing capacity of the stumps, were decidedly poor would appear from Kölliker's (Zent. f. Chir., Mar. 3, 1923) statement that of 96 thigh amputations only 2 presented good weight-bearing stumps and 4 were partially weight-bearing, i.e., an apparatus could be tolerated only part of the time. Out of 12 Gritti amputation stumps, 8 were weight-bearing, and out of 69 leg amputations, 5 were weight-bearing

and 3 partially weight-bearing. Bone scars, scars of the soft parts, neuromas and conical stumps accounted for most of the poor results.

To answer the question, "Are amputation stumps receiving adequate after-care?" C. Bearse (Boston Med. and Surg. Jour., Apr. 12, 1923) undertook a statistical inquiry, which showed that in 65 amputation cases the average interval between the operation and the ordering of a permanent artificial limb was 10 months. He deems this altogether too long, 4 to 6 months being ample under proper after-care. Only 26 per cent. of the cases were referred to limb makers by medical men, and only 17 per cent. had the fitting of their artificial limbs medically supervised. Seventy-eight per cent. had no supervision whatever after the operative wound healed. As a result, 37 per cent. had complications when they came to the limb makers, which interfered with or delayed the fitting of an artificial limb. Below-knee stumps over 8 inches long are disadvantageous in that they are usually more poorly nourished, tend to ulcerate and are more affected by cold, and the scar is more apt to break open. Besides, if the stump is too long the artificial limb cannot be tapered off so that the 2 ankles will look alike. In cases with discharging sinuses the latter should be treated before permanent artificial limbs are fitted, temporary limbs or pylons being worn in the meantime.

A variety of small, dry, atrophic stump, occurring particularly in low amputations of the leg and ankle, is discussed by R. Leriche (Presse méd., Jan. 9, 1924). This condition is usually attributed to pressure by

the prosthetic apparatus, but the writer believes there must be some other cause, having seen atrophy on but 1 side where both limbs had been amputated and identical apparatus worn on the 2 sides. Atrophy occurs especially when the soft parts seem too short and become fixed to the Small ulcers may develop, frequently hidden in a skin fold or beneath a crust. The treatment consists in excising more of the bone so as to provide healthy skin that is not adherent to it, such adhesion hindering the circulation at the end of the stump. Satisfactory results are more certain if periarterial sympathectomy is carried out at the same time. The same writer (Chir. d. Org. di. Mov., June, 1924) calls attention to the reflex sympathetic disturbances that may arise from neuromas formed during healing of the nerves of the stump. Whether the result will be trophic impairment or pain depends on the route followed by the reflex. In the painful cases he finds such procedures as reamputation, neurectomy and X-ray therapy ineffective, and advocates instead section of the sensory nerve-root.

The advantage of transplantation of the joint end in the preparation or correction of the stump where the amputation has been carried out through a joint is stressed by E. Lehmann (Beitr. z. klin. Chir., cxxxi, 242, 1924). The procedure had previously been employed by Tietze. The purpose is to secure the benefits of a joint end in the stump and at the same time have enough skin to cover it well. This is effected by sawing out a segment from the bone above the joint end and reapplying the latter to the new bone-end. Instances are

given of satisfactory results thus obtained at the knee and wrist and in the foot.

G. Bosch Arana (Prensa med. Argent., Sept. 20, 1923) recommends the formation of 1 or 2 tunnels through the muscles of *short stumps* through which cords or straps can be passed to hold the stump to the artificial limb. By this means the patient obtains better control over the prosthetic device.

AMYLOIDOSIS.—A diagnostic test for amyloid disease has been worked out by H. Bennhold (Deut. Arch. f. klin. Med., Mar. 30, 1923). He injects intravenously 10 c.c.  $(2\frac{1}{2})$ fluidrams) of a 1 per cent. solution of congo red and determines the concentration of this dye in the patient's serum 4 and 60 minutes after the injection. In patients with extensive amyloid disease from 40 to 100 per cent. (generally over 60 per cent.) of the dye is lost from the blood in the hour's interval, whereas in normal subjects and in chronic nephritis the average loss is only 20 per cent. While in some forms of renal degeneration and in syphilitic nephrosis a loss of 40 per cent. or more may be seen, in such cases there is much of the dye in the urine, whereas in amyloid discase there is practically none. The same observer (Klin. Woch., Sept. 16, 1924) asserts that there are 2 reasons for the rapid disappearance of the dye from the blood: (1) Direct adsorption by the amyloid material; (2) reduced adsorption to the plasma proteins in these cases.

### AMYOTONIA CONGENITA.

—That a familial tendency may exist in this disorder is suggested by the report of 2 cases and a possible third in the same family, by G. R. Allaben

(Jour. Amer. Med. Assoc., Sept. 13, 1924). The first case, 6 months old, was a large, bright child, unable to sit up or hold his head up, though able to move the hands and feet There seemed to be a slightly. hypertrophy of the muscles of the limbs, with flaccidity of all muscles. The knee-jerks were absent. sensation appeared normal. Wassermann of the parents was reported doubtful, then negative. The child was later treated with radium to reduce the enlarged thymus, and died of pneumonia a short time after. The second case was born 2 years later; at 5 months he developed signs of Oppenheim's disease and died some months later. Previous to these cases, another male child had died at 16 months with symptoms described by the mother as identical with those witnessed in the second case. Whereas all the male children were apparently thus affected, 2 female children in the family showed no signs of the disease.

According to W. J. Close (Med. Jour. of Austral., Feb. 23, 1924), the evidence seems to be in favor of the identity of amyotonia congenita (Oppenheim's disease) and Werdnig-Hoffmann disease or "infantile progressive spinal muscular atrophy with distinct hereditofamilial tendency." In the writer's case, aged 13 months when seen, the father and mother were first cousins on their father's side. The child appeared normally bright, and was 32 inches long, as against the normal 27 inches. The spinal column appeared abnormally long as compared to the limbs. There was almost complete paralysis and loss of tone of all the skeletal muscles, although the muscles supporting the spine did not seem as greatly affected as the limb muscles. The child died of bronchopneumonia at 28 months.

In a case of muscular weakness in an infant reported by T. C. Brereton and A. T. Cameron (Can. Med. Assoc. Jour., Nov., 1923), weakness and loss of weight, without actual paralysis or loss of reflexes, developed at 3 months. The symptoms strongly suggested amyotonia congenita, but chemical studies showed metabolic peculiarities different from those previously seen in the latter disorder. Creatin and creatinin excretion proved to be much below normal, the child appearing unable to manufacture the normal supply The mother's milk of creatin. showed the normal amount of creatinin but only a trace of creatin. At first the child, too weak to nurse, had to be fed his mother's milk with a spoon; massage and codliver oil were also ordered. Some improvement took place, but this was further enhanced by the addition of creatin in beef broth to the milk, to make up for the creatin deficit. Under this measure muscular development took place; it ceased whenever the beef broth was stopped.

With reference to muscular adynamia in general, characterized by reduction of motor efficiency in the absence of paralysis, I. Pal (Wien. klin. Woch., May 29, 1924) brings out the causal relationship of disturbed glycogenesis. In the treatment he advocates the use of caffeine. Benefit may also result from glucose infusions. Additional use of insulin will probably prove serviceable.

ANAL FISSURE.—To afford immediate, complete relief from the rectal symptoms, A. B. Graham (Jour.

Ind. State Med. Assoc., Feb., 1924) recommends the following procedure: Through a sharp-pointed, 27-gauge needle connected with a small syringe, 15 minims (1 c.c.) of a freshly prepared 5 per cent. aqueous solution of quinine and urea hydrochloride are injected slowly beneath the fissure in such a manner as to raise it The rather severe immediate pain continues only for 30 seconds, after which the pre-existing rectal pain and discomfort completely disappear. Out of 30 cases thus treated, the fissure was cured in 27, 2 had recurrences, and in 1 case complicated by a large rectal polyp the procedure was a failure.

The writer considers the measure indicated in all fissure cases previous to resort to operation. To assist in obtaining a complete cure, excision of sentinel piles, hypertrophied papillæ or skin tags, curettage of the ulcer base, partial incision of the external sphincter and local applications are also serviceable.

According to L. Delherm and R. Savignac (Paris méd., Jan. 26, 1924), 3/4 of painful anal fissures are cured by high frequency, which should therefore regularly be tried before resorting to dilatation. MacIntyre's vacuum electrodes, affording a relatively soft spark discharge, are generally used first, and later Oudin's or Delherm's electrodes, which exert much stronger fulgurating and diathermic effects. The current is gradually increased to tolerance and continued for 5 to 10 minutes.

While 15 or 20 séances are in most instances required for a cure, the painful spasms of the sphincter often cease before healing of the ulcer is completed.

ANAPHYLAXIS AND ALL-ERGY.—Numerous investigations tending toward discovery of the intimate nature of these manifestations of altered reaction on the part of the body are being recorded. While the manifestations may collectively be termed allergic phenomena, there still appear to exist reasons for dividing them into 2 groups, viz., the anaphylactic and the anaphylactoid. The term "allergy" is sometimes used in the restricted sense of an anaphylactoid state.

ANAPHYLAXIS .- Among the characteristics of anaphylactic phenomena enumerated by P. J. Hanzlik (Jour. Amer. Med. Assoc., June 21, 1924) are these: A native or complex protein is required, various polypeptids up to octapeptid being ineffective on reinjection. Parenteral administration is most efficient but not indispensable. A period of incubation is necessary for the development of hypersensitivity; upon reinjection of the same protein, the symptoms of anaphylactic shock ap-Hypersensitiveness is transferable to unsensitized animals by transfusion of blood or serum, but the shock syndrome is then mild and slow in development. The hypersensitiveness can be shown to include a hyperexcitability of the smooth muscle of certain excised organs (bronchi, uterus, pulmonary arteries, hepatic veins, etc.); therefore, the seat of the reaction is peripheral and localized in the tissues. Definite disturbances in the physical and chemical mechanisms of the blood, plasma and lymph are demonstrable during anaphylactic shock. Incubation of the serum of a sensitized animal with the antigen (protein)

results in precipitation or flocculation -corresponding to a flocculation of the plasma in vivo. While in guineapigs the immediate cause of death is bronchoconstriction, in dogs and cats there is circulatory collapse from deficient blood-supply to the heart. No anaphylactic poison, "anaphylatoxin," etc., has ever been isolated or demonstrated, all of those suggested being purely hypothetic substances, except histamine and peptone. This practically disposes of all the theories of shock concerning themselves with specificity, and leaves the cellular antibody antigen reaction as the simplest conception underlying the shock phenomena, although the interpretation of this by some is still in the specific sense.

H. M. Ray (Med. Jour. and Rec., Aug. 6, 1924) refers to the urticarial and other rashes met with as anaphylactic manifestations in man. The inspiratory asthma, due to encroachment upon the bronchial lumen, in those susceptible to a protein; the diarrhea, and the secondary drop in blood-pressure all point to an effect on the smooth muscle tissues. Other anaphylactic manifestations include a fall in temperature, leukopenia, local and general eosinophilia, diminution of complement, and reduced blood coagulability.

The so-called hemoclastic crises, to-gether with the accompanying fall of blood-pressure, leukopenia, refraction of blood platelets, and especially the changes in coagulability, suggest strongly an alteration of the colloidal complexes of the plasma. Experiments plainly show an instability of the vegetative nervous system resulting from its susceptibility to colloidal alterations of the body fluids.

In the dog contraction of the bladder is a typical anaphylactic effect. Manwaring, Hosepian, Porter and Enright (Jour. Amer. Med. Assoc., May 10, 1924) find that in dehepatized and in eviscerated dogs this bladder response to foreign protein fails to occur. An identical bladder reaction is produced by intravenous injection of histamine. They believe that the bladder response is due to histaminelike products (hepatic anaphylatoxins) explosively formed or liberated by the anaphylactic liver. Zunz and La Barre (C. r. Soc. de biol., June 20, 1924) observed in anaphylactic shock in guinea-pigs a stage of hyperglycemia with increase of proteid sugar, followed by one of hypoglycemia with pronounced increase of lactic acid in the blood.

The question of human sensitization after large amounts of horse serum has been studied by G. M. Mackenzie (Jour. of Immun., July, 1924). This, of course, has a bearing on the clinical use of serums after previous serum injections. Skin tests showed that of 16 patients who had received from 100 to 1000 c.c. of antipneumococcus or antimeningococcus serum 2 to 8 years before, 14 were definitely sensitive to horse serum. The reactions were all of the immediate type, consisting of a wheal with a zone of erythema. The intensity of skin reaction failed to show any relationship to the amount of serum previously used, the severity of serum disease or the time interval. Nevertheless, it appears that the danger attending reinjections of serum after large primary injections is greater than after the small prophylactic quantities used against diphtheria or tetanus. From a study of the literature, R. W. Lamson (Jour. Amer. Med. Assoc., Apr. 5, 1924) states that the total number of cases of "fatal anaphylaxis" is much smaller than is generally believed. About 34 per cent. give a definite history of asthma or hay fever.

> An instance of triple reaction following an intradermal injection of 0.1 mgm. of horse serum 15 years after treatment with diphtheria antitoxin is reported by S. B. Hooker (Jour. of Immun., Nov., 1923). An itching wheal appeared 10 minutes, 5 hours and 12 hours after the injection, subsiding each time before its reappearance. Further tests indicated that the triple rash resulted from multiple sensitiveness to the 3 main factors of the serum, viz., pseudoglobulin, euglobulin and albumin. The writer would account in this way for the recurrent serum rashes met with in about 6 per cent. of cases of serum

Stress has been laid of late on increased permeability of the gastrointestinal mucosa due to disease or injury as a factor predisposing to anaphylactic sensitization. K. Hajos (Zeit. f. klin. Med., May 15, 1924) was able to produce sensitization to horse . serum introduced into the stomach or rectum in guinea-pigs only when alcohol or dried oxgall was administered along with it as an irritant. X-ray exposures over the abdomen also facilitated sensitization. concludes that enteral sensitization is feasible only where there exist changes in the mucous membrane or in the liver. Arloing, Langeron and Spassitch (C. r. Soc. de biol., May 30, 1924) similarly induced anaphylactic shock in guinea-pigs by giving bile and later peptones by the stom-That such influences occur clinically is illustrated in cases recorded by Hajos (Wien, klin Woch., June 12, 1924) in which, e.g., ingestion of brandy brought on asthma,

or pork caused urticaria provided it was combined with a heavy meal or preceded by castor oil or oxgall. In another patient, hypersensitive to eggs, migraine developed whenever brandy was taken before a meal which included eggs. Similarly, dyspepsia, purgatives or enteritis may predispose to anaphylaxis. On the other hand, the X-ray appears to have a protective influence against the anaphylactic manifestations.

According to W. R. Shannon (Jour.-Lancet, May 1, 1924), anaphylaxis is secondary only to bacteria as a cause of disease in man. Furthermore, it helps to prepare the soil for the bacterial diseases. Especially in infants and children, it is often directly responsible for various cutaneous, respiratory, gastrointestinal, nervous and even genito-urinary disturbances. It underlies the symptoms of the exudative diathesis, is often responsible for symptoms of the neuropathic diathesis, and by long-continued action may give rise to many "functional" nervous disturbances, even those of grave character. It may predispose to infections by increasing the irritability of the tissues. The writer has had a number of cases of neuropathic diathesis, some with an exudative diathesis in addition, in which protein sensitization was shown to exist by skin tests and definite relief from the nervous symptoms followed specific therapy directed at the proteins to which they were sensitive.

DIAGNOSIS.—Salès and Verdier (Nourrisson, July, 1924) assert that milk anaphylaxis in infants can be differentiated from mere intolerance for cow's milk only by transmission of passive anaphylaxis to a guinea-pig. With Debray (Bull. Soc. de péd. de

Paris, Dec., 1923), they describe the technic of the required test thus: By aseptic wet cupping 6 to 10 c.c. of blood are obtained from the child and 3 to 5 c.c. of the serum therefrom injected intraperitoneally in a guinea-pig weighing about 400 Gm. After 24, or better, 36 to 40 hours, an opening is made in the guinea-pig's cranium a short distance from the midline behind the orbit [a small drill-hole should suffice.—ED.]; with a needle penetrating for 3 or 4 mm., 0.05 c.c. of sterilized cow's milk is then injected into the brain and the wound closed with paraffin. If the test is negative, no symptoms or but slight stupor follow; if it is positive, death occurs, usually within 48 hours.

Breast-fed infants may become sensitized to food proteins in the mother's milk. According to L. von Meysenbug (N. O. Med. and Surg. Jour., Mar., 1924), diagnostic skin tests in such cases can often be dispensed with by having the mother keep a record of the food taken by her for several days or a week. Generally this reveals a special penchant for some definite kind of food, which should then be tentatively excluded from her diet. Thus, 3 infants with eczema and loose bowels were cured by excluding eggs, of which the mothers had been taking from 3 to 5 daily. In another case, restlessness, crying and loose bowels in an infant were found due to excessive amounts of oatmeal taken by the mother at breakfast. Where the source of the trouble is not thus located, skin tests should be carried out with the various proteins contained in the mother's diet.

In performing dermal tests for the identification of proteins to which

children are sensitive, W. C. A. Steffen (L. I. Med. Jour., xvii, 438, 1923) makes scarifications ½ inch long and 1 inch apart on the forearm, thigh or buttock, without drawing blood. On the cuts are placed a little of the dry protein and a drop of decinormal sodium hydroxide solution. If the test is positive, an erythema, with or without a wheal, appears in from 2 to 15 minutes.

Instances are mentioned by the author in which children were found sensitive to such materials as eggs, wheat, corn, rice, potatoes, oats, peas, rabbit's hair and goose feathers, improvement uniformly setting in when the noxious material was excluded. The writer regards premature use of foods other than milk as a source of anaphylactic disturbances in children, but also favors the view of an inherited tendency toward sensitization.

In studying the relationship of sensitiveness to cow's milk in infants to nutritional disorders, A. F. Anderson and O. M. Schloss (Amer. Jour. Dis. of Childr., Nov., 1923) made use of a test for precipitin to cow's milk, thus: From 0.1 to 0.2 c.c. of the child's serum was added to 1 c.c. of from 1:50 to 1:1000 dilutions of fatfree dried cow's milk. Readings were made after incubation for 1 hour at 37.5° C. and after 24 hours on ice. The positive results ranged from distinct flocculation to complete deposition. This test was positive in 80 out of 98 marasmic infants. Out of 30 attempts at passive sensitization of guinea-pigs to cow's milk by injection of blood from these infants, 14 were positive and 4 doubtful. These results pointed to the possibility that absorption of the foreign cow's milk protein (which appeared to be promoted by the presence of diarrhea) may play a rôle in the causation of marasmus.

PROPHYLAXIS AND TREATMENT.

-Little that is new has appeared of late on these topics. In the prophylaxis of serum anaphylactic shock J. A. Kolmer ("Infection, Immunity and Therapy," Biologic Philadelphia, 1924) suggests the subcutaneous injection of  $\frac{1}{50}$  grain (0.0013 Gm.) of atropine sulphate about ½ hour before administration of the serum. Adrenalin chloride, 1 c.c. (16 minims) of the 1:1000 dilution, should be in readiness for injection if necessary. For the immediate reaction sometimes developing within 15 minutes after the serum, especially if given intravenously or intrathecally, the above-mentioned dose of adrenalin should be injected intramuscularly. Atropine sulphate, 1/120 grain (0.0005 Gm.), should also be given subcutaneously. These drugs should be ready in syringes for immediate use whenever serum is given intravenously. If the pulse is particularly soft and rapid strophanthin, 1/120 grain, may be given intramuscularly, or an equivalent preparation of digitalis.

In using Marmorek's antituberculous serum T. and J. Stephani (Schweiz, med. Woch., June 26, 1924) have observed a number of instances of more or less severe general reactions, to which tuberculous patients seem particularly subject. Patients with severe shock may have pain in the legs and lumbar regions, vomiting, flushing of the face, disturbances of hearing, violent cough and a smothering sensation. The symptoms may appear at once or 10 or 15 minutes after the injection. more advanced symptoms include pulselessness, dropping of the jaw, pupillary dilatation, relaxation of the sphincters and unconsciousness. Prophylaxis consists in the use of a fine needle, careful restriction of the injection to the subcutaneous tissues, slow injection, a pause after the introduction of the first cubic centimeter of serum, intramuscular injection of 0.25 to 0.5 c.c. (4 to 8 minims) of chloroform, and avoidance of reinjection in the same area. Previous heating of the serum to 50° C. for a time also reduces the frequency of shock. Where threatening symptoms appear, the writers have always found intramuscular injection of 1 or 2 c.c. (16 to 32 minims) of ether, repeated 1 to 3 times, effective. Camphor and digalen may be used in addition.

> In guinea-pigs H. T. Karsner and E. E. Ecker (Jour. of Inf. Dis., June, 1924) found that Witte peptone protects against serum anaphylactic shock for at least 1 hour, gradually losing this effect in 24 hours. Cephalin, a lipoid, proved highly protective in 1/2 hour, somewhat less so at the end of 1 hour, and practically ineffective after 24 hours. These writers had previously shown the protective power of an intravenous injection of heterologous serum shortly before the toxic injection of homologous or sensitizing serum. L. Képinow (C. r. Soc. de biol., May 30, 1924) found similarly effective an increase in the antitryptic titer of the serum of guinea-pigs by intraperitoneal injections of a fresh liver emulsion of other guinea-pigs.

In the disturbances due to protein sensitization in children, as noted by Steffen (loc. cit.), the most convenient measure is to remove the offending protein from the diet. If, however, the protein is an essential component of the diet, such as wheat or milk, or is present in the clothing, as wool or rabbit's hair, desensitization is indi-

cated. In the case of food proteins, this is carried out by gradual feeding or inoculation of the proteins. In infants with cow's milk anaphylaxis, Salès, Debray and Verdier (loc. cit.) start with 2 drops of milk at a feeding, or whatever amount is tolerated, then gradually increase up to the normal ration. In twins 5 months old with cow's milk anaphylaxis seen by these observers, an alternation of eczema and vomiting was noticed, both of which conditions were cured by desensitization in the 1 child that survived the acute anaphylactic manifestations.

Favorable results from peptone injections are reported by H. P. Miller (Ill. Med. Jour., Apr., 1924) in the following anaphylactic conditions: Bronchial asthma, urticaria, migraine, cyclic gastrointestinal attacks, and acute lichen planus. A 5 per cent. neutralized solution of Armour's peptonum siccum in 0.9 per cent. salt solution is used. The initial intravenous dose should not exceed 0.2 c.c. (3 minims), the amount being then increased by 0.2 or 0.3 c.c. at each biweekly injection until about 1.5 c.c. (24 minims) is reached. By increasing gradually, a point is attained where there is a slight tightening up or increase of asthmatic symptoms a few hours after injection. The next dose should be about 0.2 c.c. lower, and this should be continued as the optimum dose. A reaction is to be avoided at all times.

ALLERGY.—The following conditions are regarded as anaphylactoid phenomena, and as such synonymous with the term allergy, by Hanzlik (loc. cit.): Nitritoid crises, idiosyncrasies, hemoclasis, colloidoclasis, foreign protein or nonprotein re-

sponses, protoplasmic activation, autohemotherapy, hemotherapy and osmotherapy. Among disease conditions reported as allergic manifestations are urticaria, angioneurotic edema, dermatoses, asthma, hay fever, purpura, Ménière's syndrome, rheumatism, gout, intermittent hydrarthrosis, arthritis, hypotension, migraine, malarial attacks, serum disease, and various protein intoxications and systemic disturbances from trauma, burns, menstruation and in pregnancy.

Contrasting the characteristics of anaphylactoid with those of anaphylactic phenomena, this observer mentions the following features of the former group: A variety of agents unrelated physically and chemically are effective, native or complex proteins not being required. The phenomena occur chiefly after intravenous injection, intraperitoneal and hypodermic injections being more slowly and less intensively effective. A period of incubation, and sensitization or preliminary injection, are not required. Increased sensitivity is believed not to be transferable by transfusion of blood or serum of treated to untreated animals. Chemical and physical disturbances of the blood and tissues are demonstrable with a variety of agents, being in some respects more striking than those of anaphylactic shock. Death results from circulatory collapse and respiratory paralysis through blockage of the pulmonary capillaries by stasis, emboli, thrombi, endothelial adsorption of agglutinated masses, peribronchial and perivascular edemas, hemorrhages, etc. No elaboration of toxic substances is demonstrable. nearly identical systemic reactions

and histologic changes from totally unrelated agents such as agar, histamine, kaolin, copper sulphate and protein speak against the production of a common toxin, but rather suggest some common physical cause. In general, the only salient differences between anaphylactic and anaphylactoid phenomena relate to the period of incubation and the hyperexcitability of isolated smooth muscle that appear to be peculiar to protein anaphylaxis, and some discrepancies in the histologic changes; but these differences may be explained and reconciled on a physical basis.

> Intraperitoneal injection of the following agents in guinea-pigs was found by P. J. Hanzlik and H. T. Karsner (Jour. of Pharm. and Exp. Ther., Apr., 1924) to cause anaphylactoid phenomena, including the pulmonary changes, fatalities and, in some instances, prolongation or inhibition of blood coagulation: Glacial acetic acid, colloidal arsenous sulphide, Congo red, copper sulphate, colloidal iron, sodium oxalate and tannin. The effects were similar to, though weaker, more gradual and more lasting than, those of intravenous administration. Thus, intravenous injection is not indispensable to the production of anaphylactoid phenomena, including the histologic changes in the lungs.

According to W. W. Duke (Arch. of Int. Med., Aug., 1923), specific hypersensitiveness afflicts 12 to 15 per cent. of all adults. In outspoken cases, a positive history of the condition in 1 or both parents can be elicited in almost 50 per cent. of cases. A number of symptoms are characteristic of allergy: Ocular (edema of conjunctivæ, puffiness, redness, swelling and itching of lids, and increased lacrymal secretion); nasal (sneezing, pallor and swelling

of nasal mucous membrane, with watery or clear mucous secretion); pharyngeal (itching of soft palate and pharynx, and cough); bronchial (bronchial obstruction, often with wheezing and expectoration of clear mucoid sputum rich in eosinophiles -in lighter cases, cough and shortness of breath on exertion); cutaneous (urticaria, angioneurotic edema, eczema, erythema, pruritus). Much less characteristic are abdominal pain, various gastrointestinal upsets, frequent painful urination, headache, nervousness, asthenia and hypotension. These symptoms especially suggest allergy in the absence of another apparent cause and when the family history is positive. Scratching the skin will occasionally bring out at once a typical wheal. The patient should be made to observe whether the symptoms bear any relationship to season, time of day, geographic situation, local environment, the proximity of animals or fowl, taking food, cosmetics, wearing apparel, odors, habits, etc. trouble may be traced to dust or some article (e.g., a rug) in the house, the use of cocaine, procaine or apothesin in dentists, formaldehyde, turpentine, orris root, hay, smoke, etc. Night asthma is often due to house dust, wool or feathers. Symptoms which follow certain meals are often traceable to an article of food; if they appear frequently, to a common food, and if rarely, to an unusual

The same observer (Jour. Amer. Med. Assoc., Sept. 13, 1923) holds that in persons sensitive to food, illness may arise in 5 different ways: 1. A reaction confined to the gastrointestinal tract and due to direct contact of the food with the mucosa. 2. Disorder in any part of the body due to

general reaction to a food after its absorption and distribution. 3. Disturbance in an organ in an irritable state from allergic reaction, such disturbance being awakened by mechanical, chemical or thermic irritants, functional activity, abnormal reflexes, or other coexisting disease; such a condition often misleads, a symptom actually due to allergy being wrongly ascribed to what is only a contributory cause. 4. Illness in no wise related to allergy is occasionally made worse by reaction to foods, e.g., in a tabetic sensitive to apple and peach skin severe lightning pains invariably followed the eating of apples or peaches. 5. Definite organic disease may result from an acute or chronic state of allergic reaction.

It is important to distinguish the first of the above types of cases from the cases with symptoms occurring as part of a general reaction. In the former, the patient is usually sensitive to the food as it exists naturally, usually gives positive skin reactions, and, as a rule, the symptoms appear soon after the ingestion of food. In the latter, he is frequently not sensitive to the food as it exists naturally, but only after it has been acted on by digestive juices and bacteria; he often gives negative skin tests, reacts clinically to groups of similar foods, and gives delayed reactions.

Patients are often sensitive to the smaller constituents of a food, e.g., the lactalbumin of milk and the ovomucoid of egg, or substances in the peeling of fruit or the husk of grain. In making extracts for skin testing, unless the whole article is used, the substance responsible for the illness may be lost. Persons are usually sensitive to more than 1 food; they may be sensitive to air-carried allergens, such as dander and pollen, in addition. The degree of reaction to a food is constant in some persons, but varies greatly from time to time in others. A person may be made ill by only 1 of several foods to which he is sensitive.

Neurologic, joint or bladder symptoms, hypotension, eosinophilia, urticaria and angioneurotic edema ordinarily occur only as part of a general reaction. If a patient has nasal and bronchial allergy alone, he is usually sensitive to an air-carried allergen, but if he has in addition the above symptoms of general reaction, the trouble

is nearly always traceable to a food or some product which has reached the circulation without causing marked local disturbance. Air-carried allergens are not often absorbed in sufficient quantity to cause a general reaction.

Aside from abdominal pain after eating some particular food, other alimentary symptoms of interest are dyspepsia, nausea, vomiting, bloating, diarrhea and mucous colitis, acute or chronic. These symptoms rarely simulate other diseases perfectly, and should seldom mislead the careful physician

DIAGNOSIS.—As described by Duke, useful crude *clinical tests* can often be made by having a patient eat a suspected food or inhale a suspected vapor, perfume or emanation from furs, feathers, animals, etc., or by applying suspected substances to the skin. In persons sensitive to several foods, however, such tests may fail, especially when the reactions are delayed (*e.g.*, for 36 hours).

Two forms of skin tests are in use, each of which has its own advantages. In Walker's cutaneous or scratch method the foreign materials in dry powdered form are applied to scarified areas on the skin and a drop of decinormal sodium hydroxide solu-In the intracutaneous tion added. method, advocated by Cook and others, 0.01 c.c. of standardized solutions in varying strength are ininjected intracutaneously. In either method the appearance of a hive with pseudopods and erythema indicates a positive reaction.

The intracutaneous method gives a far greater number of positive reactions than the cutaneous, but also a greater number of false positive reactions. The cutaneous method is most useful in children, in patients sensitive to pollen and other aircarried allergens, and for irritants such as turpentine and benzol. It fails utterly in older individuals and in patients with a

general reaction, as in food cases. In these, the intracutaneous method often gives marked and convincing reactions.

For physicians who make tests on only a few patients a week, Duke recommends the "simple plate method" of preparing the solutions for intracutaneous testing: About 0.0001 Gm. of each of the suspected substances in dry powdered form is placed on a large sterile plate, and 0.1 c.c. of physiologic salt solution added to each. The solution is stirred and drawn up into a tuberculin syringe with a small needle, and 0.01 c.c. of it injected intracutaneously. Between the injections the syringe is washed thoroughly in 3 vessels of sterile salt solution, in regular rotation.

Intracutaneous testing can be shortened by the use of preliminary group tests, mixtures of 5 to 8 closely related allergens being used. Such tests show sensitiveness to a certain mixture of vegetables, grains, animal dander, sea foods, etc. Further individual tests can then be made with each allergen contained in the mixture.

Violent constitutional reactions occasionally follow intracutaneous injections. Adrenalin and atropine should be on hand ready for quick use, and be employed freely if coryza, asthma, generalized erythema or itching develops. Patients should remain in the office for ½ to 1 hour and be warned of a possible later reaction.

Ophthalmic and nasal tests are useful for testing pollens or other air-carried substances and are carried out by spraying a 1:1000 solution of the dry substance into the conjunctival sac or nose. The subcutaneous test is valuable for confirming a given diagnosis, but to avoid severe reactions only minute amounts, e.g., 0.0001 c.c. of lactalbumin, should be injected.

In obscure cases of suspected allergy the diagnosis should be based on more than 1 kind of evidence, e.g., on a positive family history or a history of other typically allergic symptoms in the individual, as well as the skin tests. When the skin reacts to 1 substance only, the real offender, as a rule, is discovered; but usually it reacts to several substances and often to several groups of substances. In this event the larger wheals usually indicate the real offenders. The diagnosis should rarely be considered conclusive un-

til the allergen responsible for the illness is found and removed with relief to the patient, and should be confirmed further, if possible, by the reproduction of the illness during a well period by renewed contact with the suspected substance.

Piness, H. Miller and Alles (Jour. Amer. Med. Assoc., Aug. 23, 1924), in a comparative study of various solvents for the extraction of substances giving allergic skin reactions (foodstuffs and animal epidermal structures only), found the most efficient solvents to be 1, 5 or 10 per cent. solutions of sodium chloride.

TREATMENT.—Several different procedures for combatting allergic disturbance are available. W. W. Duke (Amer. Jour. Med. Sci., Nov., 1923) enumerates them as follows: Avoidance or removal of the specific cause; avoidance or removal of contributory causes; specific protein treatment; non-specific protein treatment; symptomatic treatment. Usually 2 or more of these measures can be used to advantage.

The first procedure, when applicable, is the simplest. Reactions to cooked and uncooked foodstuffs may be different. A person sensitive to lactalbumin or egg white is made ill by raw milk or egg but tolerates cooked milk or egg. If sensitive to ovomucoid, however, he may be made ill by either raw or cooked egg. Pollen can usually be avoided by a change in geographic situation. Other avoidable allergens are orris root, clover or straw, turpentine, cedar oil, perfumes and flavoring extracts, benzol and gasoline, relatively uncommon foods such as tomato, onions and cabbage, animal dander, wool, drugs, and wood, gasoline or coal smoke. House asthma is often relieved by removal of rugs, disinfectants, cleaning fluids, glue, etc. Those sensitive to products formed in chronic foci of infection should be treated by removal of such foci or vaccine therapy. The many hay fever patients giving positive skin tests to vegetables, fruits or grains obtain partial relief of hay fever by avoidance of the food products to which they are sensitive.

In the event of failure to find or remove the specific cause, frequently the only recourse lies in correcting other abnormalities or illnesses, the removal of external or internal irritants, etc. Endocrin dysfunction, which is rather frequent in cases of general reaction, often adds to the severity of the illness, and its treatment may give partial relief.

Specific protein treatment applies particularly in hay fever (q.v.), and Duke has not found it as successful in other conditions. In a patient with hives and asthma due to milk, subcutaneous and oral treatment relieved these symptoms but diarrhea took their place.

Non-specific protein therapy occasionally gives good results in chronic asthma, chronic gastrointestinal disturbances (e.g., spasticity), eczema and other disorders occurring as part of a general reaction. As the nonspecific protein Duke uses colon bacilli in small dosage subcutaneously, or if this fails, ½ to ½ the subcutaneous dose (e.g., 10 million) of the bacilli intravenously. Relief from this measure may last 2 to 6 months, but rarely longer.

In the symptomatic treatment adrenalin is the most consistently active remedy. The dose should be adjusted to the individual case and ranges from 0.05 or 0.1 to 1 or 2 c.c. (3/4 or 11/2 to 16 or 32 minims). Usu-

ally 0.25 to 0.5 c.c. (4 to 8 minims) should be given subcutaneously at 5or 10-minute intervals until relief or symptoms of reaction to the drug, such as nervousness, pallor and tremor of the hands, occur. The total required amount thus determined can be repeated, if given slowly, as often as symptoms return. After a period of freedom from symptoms the dose can often be gradually reduced to 0.1 or 0.2 c.c. (1½ or 3 minims). While generally effective in asthma, adrenalin often fails in angioneurotic edema, in which very large doses are frequently required. It does not give immediate relief in eczema and other illnesses where structural tissue changes have occurred. Pituitrin subcutaneously often acts like adrenalin, but more slowly and persistently. Atropine, \( \frac{1}{300} \) to \( \frac{1}{100} \) grain (0.0002 to 0.0006 Gm.) 2 or 3 times a day subcutaneously or by mouth, is often valuable. A patient nearly relieved by other means often may be completely relieved with the help of atropine.

> According to W. S. van Leeuwen (Internat. Clin., 2, 55, 1923), adequate treatment of allergy is feasible irrespective of whether the exact cause is known or not. The chief necessity is to make certain that the patient is actually suffering from allergic disease. This can be determined at once by a single intracutaneous injection of an extract of human dandruff together with 1 control injection of physiologic salt solution. The treatment consists of small injections of a substance producing a positive reaction, usually tuberculin, milk or peptone. In general, in making intracutaneous tests with protein extracts, the first intracutaneous injection should, for the sake of safety, always be preceded by a scarification (scratch) test with the same sub

stance; the intracutaneous injection is allowed only if the scratch test is negative.

ANEMIA.—Complete study of a case of anemia now calls not only for a thorough physical examination and laboratory study of the blood, but also for the use of the X-rays to investigate suspected organs and a Wassermann test. As pointed out by C. L. Cummer (Jour. Ind. State Med. Assoc., June, 1924) the conditions underlying anemia may be classified as infections, infestations, hemorrhage, intoxications (lead, mercury, benzol, etc.), and impaired nourishment from insufficient or improper food or systemic diseases. In obscure anemia the teeth, sinuses and pelvic organs should be investigated. Syphilis is too often forgotten and malaria should be kept in mind in certain districts. Severe anemia from fish tapeworm was met with 11 times in seven years in a single hospital. Anemia is often caused by small hemorrhages, frequently repeated, as from hemorrhoids. The anemia of cancer of the stomach may be confusing because of the common gastric symptoms in pernicious anemia. Some sarcomas lead to an intense anemia.

Dietetic factors of anemia are being emphasized by various observers. Pentimalli (Rif. med., Sept. 1, 1924), on the basis of animal experiments, asserts that chronic protein intoxication, exogenous or endogenous, is a cause of anemia as well as of leukemia. F. Schweizer (Semana med., Aug. 21, 1924) observed pronounced anemia with splenomegaly in a child that had been given milk almost exclusively up to the age of 28 months. Recovery from the anemia as well as

subsidence of the spleen occurred upon change of diet.

Two cases of severe anemia in children of the same family in successive pregnancies are reported by D. H. Boyd (Atlant. Med. Jour., Apr., 1924). One died at 11 months and the other improved and was lost sight of. The cases conformed to the type known as von Jaksch's anemia. A congenital factor in the etiology is suggested. Poor food supply, defective hygiene, or chronic infection, such as syphilis or tuberculosis, may contribute to the development of the anemia in such predisposed cases. The treatment used in these cases consisted of a milk formula in addition to the breast feeding, beef juice, Fowler's solution by mouth and iron citrate hypodermically. The use of human blood subcutaneously or intravenously was objected to by the parents.

PATHOLOGY.—The anemias are divided by A. C. Hampson and J. W. Shackle (Guy's Hosp. Rep., Apr., 1924) into the megalocytic and the non-megalocytic, the former comprising Addison's anemia and the anemias of sprue and Bothriocephalus latus infestation. In Addison's anemia megalocytes were frequently found to be almost the only cells present. For various reasons the writers deem megalocytosis and hemolysis to be due to different factors.

Sickle cell anemia is described by V. P. Sydenstricker (So. Med. Jour., Mar., 1924), on the basis of 40 cases, as a familial, hereditary disease apparently confined to the negro race and featured by sickle-shaped and oat-shaped poikilocytes. In active cases these cells make up from 5 to 40 per cent. of all the red cells. As remission sets in they may almost disappear. In latent cases the fresh blood and stained smears show no

changes beyond moderate anisocytosis and polychromasia, but when the blood is sealed under a cover-slip, bizarre and crescentic forms appear in a few hours, until after 24 to 36 hours 40 to 90 per cent. of the cells have assumed sickle forms. Muscle and joint pains, abdominal crises, a greenish-yellow scleral discoloration, general glandular enlargement and urobilinuria are constant evidences of the disease in its active periods. The patients ranged in age from 3 months to 67 years. Necropsy findings point to a primary functional perversion of the blood-forming or-Increased blood destruction is evidenced by the pigmentation of the tissues, the presence of bile pigments in the blood and urobilinuria. The spleen always shows grave lesions. The disease is dangerous in children, but not in adults. treatment is symptomatic. Remissions may be hastened and prolonged by iron, arsenic and forced feeding. Blood transfusion yields a temporary favorable effect.

Considerable doubt has existed regarding the proper classification and causative factors of aplastic anemia. According to H. E. Marsh (Ann. of Clin. Med., Aug., 1924), there are a number of features which differentiate it clearly from pernicious anemia: Most cases are less than 35 years of age; death within 1 or 2 months occurs, without any remissions; the leukocytes and erythrocytes are much reduced, with a color index usually below 1; the erythrocytes are perfectly normal, unless some parts of the marrow are uninvolved and hyperplastic; the leukocytes are usually reduced to about 2000; the disease always runs a febrile course; glossitis, sore mouth, and symptoms of central nervous changes, such as paresthesia, are wanting; there is no evidence of the excessive hemolysis of pernicious anemia; the skin does not have the lemon yellow hue, nor is hemosiderin found in the internal organs. The disease is ascribed to some severe toxin acting on the bone marrow; it may be the virus of Hodgkin's disease or of some other disease. The writer's case was unusual in that there was no decrease of neutrophiles and no hemorrhages. It came on some months after Hodgkin's disease, and the post-mortem histologic appearance of the bone marrow, with lymphoid accumulations about the vessels, suggested a toxic effect of Hodgkin's virus. C. Dyke (Lancet, May 24, 1924) has reported 4 cases of aplastic anemia with hemorrhagic tendency, leukopenia, and disappearance of the blood platelets. In the 3 cases in which the bone marrow was examined after death it was possible to demonstrate an infection of the marrow, in 1 case streptococcal, in another tuberculous, and in the third, by a coliform bacillus.

TREATMENT.—In some forms of anemia E. Meulengracht (Acta med. scand., Sept. 25, 1923) finds that large doses of iron yield better results than small. He has been giving 0.5 Gm. (71/2 grains) of iron lactate 3 times daily, 0.5 to 1 Gm.  $(7\frac{1}{2})$ to 15 grains) of reduced iron 3 times daily, and a colloidal iron preparation, likewise 3 times daily. In chlorosis the hemoglobin may rise 20 to 30 per cent. in a week under such dosage. The anemia of chronic achylia gastrica is overcome by large doses where small doses have failed. The same was frequently the case in

anemias attending chronic infections, such as polyarthritis.

Some observers prefer colloidal iron injections to other modes of iron administration. Thus, M. Schaefer (Deut. med. Woch., Aug. 1, 1924) injects intravenously an electrolytic preparation known as electroferrol in doses of 1 c.c. (16 minims). Usually 3 or 4 injections suffice, given first at intervals of only 3 to 6 days, then of 8 to 14 days. In some patients reactions, probably allergic, featured by chills, fever, headache and vomiting, follow the injections, which should therefore be avoided in cases with active tuberculosis or acute disease. The treatment often increases the hemoglobin by 10 per cent. in a few days, the erythrocytes rising more slowly. Intramuscular injections may be used if the veins are unsatisfactory for intravenous injections, but the results are inferior. The benefit is ascribed not only to the specific iron effect but also to the reaction caused by the colloid preparation as a foreign substance parenterally administered. On the other hand, B. Aschner (Wien. Arch. f. klin. Med., Jan., 1923) saw no benefit from colloidal iron intravenously in 9 cases, and ascribes the failure to the low iron content of the prepara-

A majority of the recent reports on germanium dioxide are unfavorable. H. W. Schmitz (Jour. of Lab. and Clin. Med., Mar., 1924), using it in 26 cases of various forms of anemia, observed in all instances but 1 a definite response by marked and sustained increases in the red cells and hemoglobin. The best results were in anemia following malnutrition and acute infections. The dos-

age ranged from 30 to 60 mgm. (1/2) to 1 grain) daily or on alternate days until 0.3 to 1 Gm. (5 to 15 grains) had been given. The drug was given by mouth in a 0.2 per cent. solution. On the other hand, G. R. Minot and J. J. Sampson (Boston Med. and Surg. Jour., Nov. 1, 1923), from animal experiments and treatment of 8 cases intramuscularly or by mouth, conclude that germanium dioxide may induce a transient increase of red cells in the peripheral blood, but that there is no evidence of its being a powerful erythropoietic stimulant. J. D. Garvin (Minn. Med., June, 1924) reports 19 cases treated at the Mayo Clinic with the compound in either acid or alkaline solution, in cation or anion form, given hypodermically in doses of 0.012 to 0.02 Gm. ( $\frac{1}{5}$  to  $\frac{1}{3}$ grain), or by mouth in doses of 0.01 to 0.1 Gm. (1/6 to 11/2 grains), every 1 to 4 days over periods of 1 to 5 weeks, with little effect on the red cells or hemoglobin except in 2 cases. Most of these were cases of anemia in chronic nephritis or chronic infectious arthritis.

More serviceable, apparently, is the suggestion of C. D. Leake and J. S. Evans (Wis. Med. Jour., Dec., 1923) to use desiccated red bone marrow and spleen combined in equal amounts in 0.3-Gm. (5-grain) capsules 3 times daily before meals with plenty of water. In animal experiments these products had proven more effective in combination than when given alone. In normal human subjects they were found to cause a marked increase in the red cells, with a slower, less pronounced rise in the hemoglobin, the latter better maintained after cessation of administration than the increase of the

cells. In anemias the dosage, upon improvement, was reduced to 2 and then 1 capsule daily, and the treatment withdrawn as soon as the red cells and hemoglobin remained con-Anemias were improved in the following order: 1. Grave chronic secondary anemias of undetermined origin, with many features of the pernicious type, and in which iron and arsenic, and in some cases transfusions, had failed. 2. Grave active secondary anemias of acute septic infections. 3. Chronic anemias accompanying chronic infections. 4. Dietary anemias of infants (preparation given in boiled and filtered solution as a broth in patients too small to take capsules). 5. Menorrhagic ane-6. Mild chloro-anemias of The value of the treatment in primary pernicious anemia is doubtful.

Blood transfusion is regarded by W. W. Duke and D. D. Stofer (Mo. State Med. Assoc. Jour., May, 1923) as the logical method of treating anemia of almost every type. It is harmless if the technic is good and the donors carefully chosen and gives immediate, certain results, the permanence of which, however, depends on the cause of the condition. According to W. W. G. Maclachlan (N. Y. State Jour. of Med., Feb. 15, 1924), transfusion has given good results in secondary anemias associated with pregnancy, lead poisoning, hemorrhoids, and bleeding from chronic peptic ulcer. The red cell and hemoglobin response is much greater in secondary than in primary anemias.

In a case reported by G. H. Schneider (Monats. f. Geb. u. Gyn., Mar., 1924), a woman in her 3d pregnancy developed a hemolytic anemia

so severe as to reduce her hemoglobin to 40 per cent, and red cells to 1,920,000. At this juncture, in the 8th month of pregnancy, labor was induced. Ten days after delivery the hemoglobin had risen to 60 and the cells to 4,200,000.

M. Levy (Strahlenth., xvii, 404, 1924) produced a severe anemia in mice by phenylhydrazin injections and treated some of the animals with the ultra-violet rays. hemoglobin and red cells rose almost to normal after 2 or 3 exposures, whereas the untreated animals died in a few days. The benefit of the rays in toxic anemia is ascribed both to stimulation of the bone-marrow and promotion of elimination of pathologic blood elements. Attention is called to the rapid improvement frequently occurring in anemias at high altitudes; the ultraviolet light in this connection is regarded as representing an artificial mountain sun.

Discussing secondary anemia in infancy, H. M. M. MacKay (Lancet, July 28, 1923) lays stress on the influence of a too prolonged, exclusive milk diet, which may induce anemia either through iron starvation or possibly also through a toxic effect of the excess of milk. Of 36 artificially fed infants given milk or milk and carbohydrate diets, with or without codliver oil, a majority became anemic by the end of the first year of life, and in some instances even by the 7th month. The giving of vegetables at 6 or 7 months failed to forestall the anemia, but inorganic iron by the mouth produced improvement in most instances. A noticeable feature was that the hemoglobin did not begin to improve until 3 to 6 weeks from the start of treat-

ment, after which rapid betterment occurred. Experiments have shown that iron retention by infants is much greater from human than from cow's or goat's milk. B. R. Hoobler (Jour. Mich. State Med. Soc., Apr., 1924) advocates greater attention to the diet in the anemias of infancy. Along with iron and arsenic or both, a sufficient diet containing much iron and vitamins should be given, with vegetables and cereals rich in iron as well as the animal foods. A mixed diet, represented in Whipple's experiments by bread, rice, potato and milk, promotes regeneration of the blood, while a high carbohydrate diet favors anemia.

ANEMIA, PERNICIOUS.—Analyzing 111 cases, C. R. Willson and F. A. Evans (Bull. Johns Hopk. Hosp., Feb., 1924) found 82 cases in men and 29 in women. There were only 8 cases among negroes. Occupation did not appear as an etiologic Aside from the constant anisocytosis and poikilocytosis, basophilia proved rather uncommon. Leukopenia is characteristic, but leukocytosis may occur in the presence of an infection. An eosinophilia as high as 17 per cent. may be found, but an actual increase in eosinophile cells is the rare exception. The same applies to the large mononuclear and transitional cells. Myelocytes as high as 10 per cent, may be found in an occasional case. Free HCl in the gastric contents is so rare that its presence should put the diagnosis under suspicion. The spleen is palpable in only about 20 per cent. and the liver in 33 per cent. All patients, aside from other discomforts, have 1 or more of the following symptoms: Weakness, disturbances of digestion and nervous disorders of the extremities.

Fever was noted by Panton, Maitland-Jones and Riddoch (Lancet, Feb. 10, 1923) at 1 time or another in 90 out of 117 cases, the average range being from 99 to 100° F. Improvement was, as a rule, synchronous with disappearance of the The more acute the case, fever. the most constant the presence of fever. While the very frequent occurrence of achylia was noteworthy, it is not considered by these observers an essential etiologic factor. On the other hand, A. F. Hurst (Brit. Med. Jour., Jan. 19, 1924) states that achlorhydria is far more constant than any other symptom, even the anemia, and considers it an essential predisposing cause both to pernicious anemia and subacute combined degeneration of the spinal cord, either of which may predominate in the resulting illness. The achlorhydria enables bacteria from the mouth when oral sepsis exists to infect the intestine, and of the resulting poisons 1 is hemolytic while another is especially toxic to nervous tissues. The writer disagrees, however, with Hunter's view that oral sepsis and glossitis constitute a specific symptom of pernicious anemia, having observed them in 3 cases of severe, but not hemolytic anemia, of which 1 was secondary to cancer of the colon.

Paralleling the glossitis of pernicious anemia, Schwenkenbecher (Klin. Woch., Aug., 1924) reports having observed pain and vesiculation in the nose in these cases.

The frequency of disturbed renal function in pernicious anemia is emphasized by E. J. Stieglitz (Arch. of Int.

Med., Jan., 1924), 62 per cent. of 50 cases having shown albuminuria, casts, or both. Iron becomes deposited in the convoluted tubules, and there is often degeneration of the tubular epithelium, probably due in part to the iron, with resulting inhibition of the passage of water and total solids and reduction of specific gravity of the urine. Fixation of the specific gravity and an increase of night over day urine volume are characteristic renal functional changes, and these, with the hemosiderosis, are so specific that the condition may be termed "the nephritis of pernicious anemia."

ETIOLOGY AND PATHO-GENESIS.—Special attention has been paid of late to toxic absorption of bacterial origin from the gastrointestinal tract as a factor in the genesis of pernicious anemia. Seyderhelm (Klin. Woch., Apr. 1, 1924) refers to organic changes found in the walls of the small intestine in pernicious anemia by Wallgren, and ascribes the anemia to a breaking down of the power of the small intestine to protect itself against invasion by the bacterial flora of the large intestine. Bacteriologic studies have shown that in pernicious anemia an abnormally abundant flora, similar in character to the colonic flora, is present throughout the small bowel up to the duodenum. In 10 cases of pernicious anemia in which an artificial anus was established above the ileocecal valve, dark brown fluid with fecal odor and abundance of colon bacilli was found. Where the character of this material improved as a result of the artificial outlet, the anemia also rapidly improved; when the artificial

anus was closed again, the condition became rapidly worse. The normal colonic flora is harmless in the colon, but when it passes into the small bowel the greater absorptive power therein leads, according to this observer, to systemic intoxication and damage to the blood. According to this conception, the treatment indicated is to reduce putrefaction in the small intestine by exclusion of proteins from the diet and administration of carbohydrates and fats. P. Wichels (Zeit. f. klin. Med., July 25, 1924) found many colon bacilli in the gastric contents from the fasting stomach in nearly all cases of pernicious anemia or of gastric cancer, while in normal subjects and cases of gastric ulcer or simple achylia the gastric contents were generally sterile. He regards the finding of colon bacilli in the stomach as diagnostically significant of pernicious anemia.

To some extent confirmatory of the gastrointestinal origin of pernicious anemia are 3 cases reported by V. Coates (Brit. Med. Jour., Apr. 21, 1923), in which colitis, sprue and ulcers preceded and seemed to bear a causal relationship to such an anemia.

According to F. W. Peabody and G. O. Brown (Jour. Amer. Med. Assoc., Mar. 22, 1924), attempts to find hemolytic toxins in the blood serum and to determine alterations in the fragility of the erythrocytes have not proved definitely significant. These observers have, however, in a group of typical cases, found an entirely different process, which must account for a considerable amount of blood destruction, viz., phagocytosis of erythrocytes by endothelial cells, particularly in the bone marrow.

In all but 1 of C. Aubertin's (Presse méd., Jan. 5, 1924) cases of the pernicious anemia of pregnancy there had been a succession of pregnancies at short intervals. Occasional cases in primiparæ have, however, been reported. Edema affecting the legs, backs of the hands, eyelids, and at times the trunk, with or without ascites, seems to be an essential manifestation of this form of pernicious anemia. Frequently there is slight fever. Hemorrhages are uncommon, except in the retina. Features of the blood condition in the writer's cases were a leukocytosis, usually of about 15,000, and absence of eosinophilia. Recovery may occur upon expulsion of the fetus. The most useful therapeutic measure is repeated subcutaneous administration of 30 to 100 c.c. (1 to  $3\frac{1}{3}$  ounces) of citrated blood. If syphilis coexists, antisyphilitic treatment assists in recovery after the uterus has been evacuated.

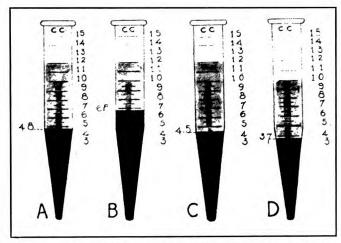
Instead of the cholesterinemia and adrenal hypertrophy of normal pregnancy, R. Benda (Zent. f. Gyn., Aug. 23, 1924) found hypocholesterinemia and atrophy of the adrenals in 2 cases of pernicious anemia in pregnancy. The reduction in cholesterin is ascribed to the adrenal atrophy and regarded as responsible for the fatal anemia, the remaining cholesterin being insufficient to prevent the hemolytic action of the pregnancy toxins.

PATHOLOGY.—In a study of the nucleated red cells in 34 cases of pernicious anemia, all with glossitis and achlorhydria, A. Piney (Jour. of Path. and Bact., July, 1924) found the cell with reticular nucleus in all cases during both remissions and relapses. This cell appears to be specific in character, and the term me-

galoblast should be applied to it. Cells with cart-wheel nuclei were found only in the stages of marked anemia, and the large cart-wheel forms only occasionally in cases with a red cell count below 1,500,000. These cells should be termed macroblasts, or preferably macronormoblasts, and normoblasts, according as they are large or small. Aside from the series of 34 cases, megaloblasts were found only in 1 case of

cases, and the yellow or greenishyellow color of the serum, readily recognized by the naked eye. Normal serum is pale yellow, while the serum of secondary anemia ranges from a pale to a deep straw color, readily distinguishable from the color in pernicious anemia.

The volume index of the red corpuscles, i.e., the volume percentage of these cells divided by their number percentage, affords, according to R. L.



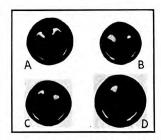
Volume of packed red corpuscles obtained on centrifugating 10 c.c. of blood containing 5,000,000 red cells per cubic millimeter. A. Normal blood: Volume of packed cells, 4.8 c.c. (100 per cent. of normal); volume index, 1.00. B. Pernicious anemia: Volume of packed cells, 6.8 c.c. (141 per cent. of normal); volume index, 1.41. C. Chronic secondary anemia not due to hemorrhage: Volume of packed cells, 4.5 c.c. (94 per cent. of normal); volume index, 0.94. D. Chronic hemorrhagic anemia: Volume of packed cells, 3.7 c.c. (77 per cent. of normal); volume index, 0.77. (Haden, in Jour. Amer. Med. Assoc.).

acholuric family jaundice and 1 of bothriocephalus anemia. In a case of bone carcinosis from gastric cancer with numerous nucleated reds, all were found to be of the cartwheel variety.

DIAGNOSIS.—According to C. E. Riggs (Minn. Med., July, 1924), the practitioner can make a diagnosis of pernicious anemia before definite changes have developed by the distinctive nervous disturbances, observed in over 80 per cent. of the

Haden (Jour. Amer. Med. Assoc., Aug. 30, 1924), a more accurate and hence more valuable diagnostic indication of pernicious anemia than the color index, which is subject to the great variations in hemoglobin readings made in different laboratories. In determining the volume index he withdraws 10 c.c. of blood by vein puncture and runs it into a graduated centrifuge tube containing 2 c.c. of 1.6 per cent. sodium oxalate solution (an isotonic anticoagulant).

Upon centrifugation of the tube for 1/2 hour the true volume of the packed erythrocytes is thus obtained. Normal blood containing 5,000,000 red cells per cu. mm. yields 4.8 c.c. of packed cells. In an anemic blood yielding only 2.4 c.c. of packed cells, the volume percentage of cells would be expressed as 50 (per cent.). If the red cell count of such a blood were 3,000,000, its number percentage of cells would be expressed as 60 (per cent.). The volume index would then be expressed by the fraction  $^{5}\%_{60} = 0.83$ . Haden also deems diagnostically useful the saturation index



Models of red blood cells, showing the relative volume in different conditions. A. Normal adults: Volume index, 1.00 (average of 52 cases). B. Chronic hemorrhagic anemia: Volume index, 0.77 (average of 8 cases). C. Chronic secondary anemia not due to hemorrhage: Volume index, 0.94 (average of 47 cases). D. Pernicious anemia: Volume index, 1.41 (average of 50 cases). (Haden, in Jour. Amer. Med. Assoc.).

of the red corpuscles, *i.e.*, the hemoglobin percentage divided by the volume percentage of the red cells. If the hemoglobin percentage in the example just given were 40, the saturation index would be  $^{4}\%_{0}$ =0.80. Whereas the color index indicates only the amount of hemoglobin per red cell, the saturation index expresses the amount of hemoglobin per unit volume of red cells. Many of the red cells being larger than normal in pernicious anemia, the color

index is high; but the saturation index tends to fall below 1, showing that the actual concentration of hemoglobin in the red cells is lower than normal.

In a study of 171 individuals, Haden found the 3 indexes-volume, color and saturation—always 1.00, within the limits of technical error, in normal adults. In secondary anemia, the indexes were usually below 1.00, seldom above it. In pernicious anemia (50 cases) a volume index above 1.00 proved constant (average: 1.41), and is deemed by the writer of marked diagnostic service, being present even in early cases in which other qualitative changes (anisocytosis, nucleated reds) are not apparent. The color index (average: 1.29) in pernicious anemia is never greater, but usually less than the volume index. The saturation index never exceeds 1.00 (average: 0.92). combination of absence of free HCl in the gastric juice and a volume index above 1.00 is characteristic and constant in, and probably essential for the diagnosis of, pernicious anemia.

The diagnostic importance of the hemolytic features, clinical and hematologic, of pernicious anemia is stressed by A. Stengel (Atlantic Med. Jour., Sept., 1924). Hemolytic anemia associated with carcinoma or tertiary syphilis is differentiated from it by the relative poverty of hemoglobin, leukocytic excess, and general appearance suggesting a severe underlying cause. Splenomegalic icteroanemia is distinguished by the excessive enlargement of the spleen, marked icterus and fragility of the red corpuscles. In the absence of hematologic and hemolytic findings

the following group of manifestations is significant: Swollen, red or painful tongue; achlorhydria, progressive spinal cord degeneration; asthenia; fair preservation of body weight, and intense anemia. Zadek (Klin. Woch., Aug. 12, 1924) emphasizes the value of increased urobilin in the feces as an evidence of hemolysis in pernicious anemia.

An insidious form of infectious anemia (anemia lenta), simulating pernicious anemia and occurring in cases designated by the term "chroniosepticemia," is described by F. E. R. Loewenhardt (Klin. Woch., Oct. 15, 1923). Features distinguishing the condition from pernicious anemia include a grayish yellow skin, softness of the spleen, remittent febrile temperature, and in particular, the bacterial findings, consisting of anhemolytic streptococci from the blood stream in 1 of the writer's cases and both hemolytic and anhemolytic streptococci in the other. Both cases proved refractory to treatment.

PROGNOSIS.—A rise in the antihemolytic power of the serum, which becomes manifest very quickly through subjective improvement and often through an absolute increase in the polymorphonuclear leukocytes, precedes an oncoming remission by several days, according to F. A. Evans (Pa. Med. Jour., Jan., 1923). These manifestations are therefore an aid to judgment in relation to the indication or lack of indication for a proposed blood transfusion.

A persistent subfebrile temperature is regarded as an unfavorable prognostic indication by H. Lehmann (Deut. Arch. f. klin. Med., July, 1924), whereas a fall of temperature is a favorable sign. A parallelism between decrease of temperature and rise of hemoglobin was observed in

85 out of 90 cases. Increase of the amount of *urobilin* in the stools, noticed in a patient in the stage of remission, portends a relapse, according to I. Zadek (Münch. med. Woch., July 11, 1924).

TREATMENT.—The same observer (Deut. med. Woch., Aug. 22, 1924) points out that the time at which treatment is to be given in pernicious anemia is a feature deserving some consideration. In periods of remission, treatment is unnecessary, while in those of rapid blood destruction, it is definitely indicated, especially arsenic and blood injections. Other measures to stimulate the bone marrow include protein therapy, bone-marrow preparations and splenectomy. For purposes of detoxication, absorbents and irrigations of the gastrointestinal tract and exclusion of the bowel are available, while to reduce hemolysis, collargol may be used with the intention of blocking the reticular epithelium.

With regard to arsenic, some European observers commend the socalled Neisser method of administration, which consists, as mentioned by H. von Winterfeld (Wratsch, June, 1924), in giving arsenic trioxide in pills, beginning with a total of 0.02 Gm. (1/3 grain) a day and increasing gradually until the hemoglobin begins to rise, when the medication is abruptly stopped. This has sometimes involved a dosage as high as 0.1 or 0.15 Gm.  $(1\frac{1}{2})$  or  $2\frac{1}{4}$  grains) a day. Or, sodium arsenate may be given in pills of 0.001 Gm. (1/65 grain) each, with the dosage progressively raised from 1 to 4 or 5 pills 3 times daily. According to A. Engelhard (Deut. Arch. f. klin. Med., July, 1924), the large doses used in Neisser's method are well borne. Out of 8 cases thus treated, 5 were definitely improved.

A colloidal iron preparation, electroferrol, is recommended by A. Hittmair (Wien. klin. Woch., Oct. 4, 1923) in doses ascending from 0.25 to 4 c.c. (4 to 64 minims) of the 0.5 per cent. solution, given intravenously once or twice a week. If this fails, ascending and then descending doses of neoarsphenamin may be tried, at intervals of 10 to 14 days. The writer attained large doses of the arsenical, up to 0.97 Gm., without observing any untoward results.

Germanium dioxide was tried by A. Stengel (loc. cit.) in 13 cases in varying dosage, hypodermically or by mouth, but proved quite ineffective.

A. F. Hurst (Brit. Med. Jour., Jan. 19, 1924), regarding pernicious anemia as a result of enterogenous intoxication, advises thorough correction of oral sepsis and large doses of dilute hydrochloric acid, with addition of 1 grain (0.06 Gm.) of pepsin to each dram (4 c.c.) of the acid. Milk soured with an active lactic acid bacillus is also advised, together with an autogenous vaccine made from the hemolytic streptococcus isolated, if present, from the duodenum, or, if not obtainable, from the teeth and tonsils. Splenectomy may prove to be of value if employed along with other measures. According to clinical tests by M. E. Shaw (Quart. Jour. of Med., July, 1924), much larger doses of hydrochloric acid than are customary should be given;  $1\frac{1}{2}$  to  $2\frac{1}{2}$  fluidrams (6 to 10 c.c.) of the dilute acid are required after each meal to restore the effective germicidal activity of the gastric juice. This should be given in divided

amounts every 15 minutes for 21/2 hours after the meal.

Administration of iodine in pernicious anemia is advocated by G. Holler (Wien. klin. Woch., June 26, 1924), who found iodine absent from the thyroid gland in these cases. He gives 3 to 5 drops of a 5 per cent. solution of potassium iodide by mouth 3 times daily for prolonged periods. The effects are slower but more lasting than those of arsenic, which may, however, be given at the same time. Splenectomy may advantageously precede the iodide treat-B. Bramwell (Brit. Med. Jour., Mar. 1, 1924) has seen good results from parathyroid extract in pernicious anemia.

Another new measure is the intravenous injection of sodium citrate, recommended by Normet (Bull. de l'Acad. de méd., Dec. 27, 1923) in all anemias with a high color index. The dose is 0.02 Gm. (1/3 grain) per kilogram (2.14 pounds) of body weight, given in a 3 per cent. solution. Six such injections are administered at weekly intervals. In favorable cases an increase of 600,000 to 1,000,000 red cells takes place during the week following an injection. The ultimate result cannot be estimated, however, until 2 or 3 weeks after the final injection. Cases of pernicious aplastic anemia refractory to arsenic and iron are stated to have recovered under this treatment.

H. von Winterfeld (Münch. med. Woch., Feb. 15, 1924) reports gradual, complete return to health in 4 out of 5 cases as a result of subcutaneous injections of autogenous colon bacillus vaccine. The dose is rapidly increased from 100 to 300 million bacteria, given on alternate days. The more marked the local skin reaction, the better the results, though if the reaction is too severe, the dose should be reduced. Vaccines prepared from the duodenal contents proved more efficient than those prepared from the stools. This treatment is based on Seyderhelm's view that pernicious anemia is due to toxic absorption from ascent of colon bacilli from the colon throughout the small intestine.

The consensus of opinion in regard to blood transfusion appears to be that it is in most cases useful for stimulating remissions. According to A. H. Colwell (Pa. Med. Jour., Jan., 1923), small doses of blood frequently repeated are as useful as larger ones, while entailing less risk. On the other hand, Hickl, Jagic and Nather (Wien. klin. Woch., Apr. 10, 1924) advocate large transfusions at weekly intervals. W. W. G. Maclachlan (N. Y. State Jour. of Med., Feb. 15, 1924) comments on the striking immediate results from doses of 200 to 250 c.c. frequently repeated. He finds the citrate method more convenient than the whole blood procedure and no more likely to produce severe reactions, provided the blood is not introduced too rapidly. Some severe reactions occur even with properly matched donors and recipients, suggesting that there may exist at times some factor of incompatibility other than agglutination.

Injection of defibrinated, frozen and warmed own blood was observed by K. Walter (Münch. med. Woch., June 27, 1924) to cause pronounced stimulation of blood production in normal individuals. Applying the principle of non-specific stimulation in pernicious anemia, he obtained some benefit by giving intramuscular in-

jections of 10 c.c. of blood at weekly intervals.

In a case seen by T. Dervis (*Ibid.*, July 11, 1924) expulsion of a tapeworm—*Tænia solium*—was followed by complete recovery from what had appeared from the blood findings to be a typical condition of pernicious anemia.

A new surgical treatment of the disease is described by Walterhöfer and Schramm (Acta med. scandin., Mar. 19, 1924). It is based on the observation that removal of bone marrow results in regeneration of normally functioning marrow, and consists in the exposure and scraping out of the bone marrow in 1 or more long bones—especially the tibia. The procedure was found well tolerated even in very far advanced cases. It seemed to increase the power of the system to respond to conservative measures such as arsenic or blood transfusion. In 48 per cent. of cases in which other measures had failed the treatment yielded improvement. A late modification of the original surgical procedure is to wash out the bone marrow in the selected bones by driving a stream of normosal (essentially an isotonic mixture of salts intended to simulate the blood serum) through drill holes in the bone.

ANESTHESIA.—Chloroform, ether, ethyl chloride, ethylene and nitrous oxide being taken up under their respective headings, the present section will deal only with certain general considerations and a few of the special methods of anesthesia, viz., the local, spinal, sacral, paravertebral, splanchnic and synergistic procedures.

#### GENERAL CONSIDERATIONS.

—In regard to anesthesia in bad opera-

tive risks, E. A. Tyler (Amer. Jour. of Surg., Apr., 1924) asserts that, since nitrous oxide-oxygen has no lasting effect on the lungs or kidneys and is quickly eliminated, it should be selected in doubtful cases with damaged lungs, kidneys or heart-muscle. It can be given whether the bloodpressure is high or low, having a minimum effect on it. Cases with a weakened myocardium should receive tincture of digitalis for a few days to a month before operation as well as, frequently, for a few days after operation. J. Y. Welborn (Surg., Gyn. and Obst., July, 1923), while partial to the use of nitrousoxide oxygen, quotes McKesson to the effect that not over 6 or 8 hospitals in the United States use gas for all operations, and warns against the risk from inexperienced anesthetists with this anesthetic, for the reason that in the second stratum of the stage of anesthesia there is apt to occur a spasm of the muscles, due to too high a percentage of gas and improved by addition of oxygen. The anesthetist, if he misconstrues this condition as meaning insufficient anesthesia, will give more gas, thereby causing death.

A method of preliminary medication whereby the ether or chloroform used in operations can be reduced to very small amounts or even omitted completely has been used in 60 cases and is described by P. Fredet and R. Perlis (Bull. Soc. nat. de chir., July 5, 1924). Morphine hydrochloride, 0.01 Gm. (1/6 grain), and scopolamine hydrobromide, 0.00075 to 0.001 Gm. (1/80 to 1/64 grain), are first given and followed in 15 or 30 minutes by an intravenous injection of 5 to 8 c.c. (80 to 130 minims) of somnifen (the

solution containing 0.25 Gm. of this drug per c.c.). Sleep immediately follows this injection, and efficient anesthesia requires, in many instances, the additional use of but 5 or 2 Gm. (55 or 22 minims) of chloroform or even none at all. The anesthesia persists for 3 hours; additional use of a little chloroform or ether may be advisable during skin incision or suturing. No toxic effects on the heart, respiratory centers, liver or kidneys result, and postoperative vomiting is rare. The only drawback is that the patients remain somnolent for 12 to 36 hours after operation and during this time require some assistance to eat, urinate, Postoperative pain is eliminetc. ated.

De-Etherization.—J. C. White (Arch. of Surg., Sept., 1923) calls attention to the advantages of administering carbon dioxide to increase pulmonary ventilation and accelerate the elimination of ether through the lungs under certain circumstances. gas is supplied from a tank. Pulmonary ventilation is nearly doubled when the carbon dioxide of the inspired air reaches 5 per cent., and is quadrupled at 6 per cent. The administration being begun as soon as the wound is closed, recovery of consciousness is 3 to 5 times more rapid; the blood-pressure, circulation and color are improved, and nausea, vomiting, etc., reduced. The procedure is indicated: (1) When respiration is subnormal from reduction of free CO2 or depression of the respiratory center other than that due to ether, as in cerebral cases; (2) persons having had excessive discomfort after previous ether anesthesias; (3) cases of ventral hernia or large abdominal wounds which make vomiting especially undesirable; (4) cases of shock and toxic conditions in which the deleterious effects of ether must be minimal.

Syncope.—In view of the occasional reflex inhibitory action and syncope resulting from irritation of the nasal mucosa by inhaled chloroform, H. Strube (Monats. f. Geb. u. Gyn., Nov., 1923) recommends anew the preliminary spraying of a 1 to 5 per cent. solution of cocaine into the nose.

Vomiting.—In 60 cases of mixed chloroform and ether anesthesia L. Nürnberger (Arch. f. Gyn., No. 2, 147, 1924) observed that postanesthetic vomiting and other disturbances bore a relationship to the hydrogen ion concentration of the urine, the cases in which the ionic acidity happened to increase proving less liable to such symptoms. He explains on this basis the considerable reduction of postanesthetic vomiting he observed from injecting intravenously 5 c.c. (80 minims) of a 5 or 10 per cent. solution of sodium chloride at the beginning and end of the anesthesia and also 45 minutes later. A similar reduction of vomiting as a result of the employment of this measure had already been reported in X-ray sickness.

Children.—To facilitate induction of anesthesia in children and nervous or timid adults, H. Dreesmann (Zent. f. Chir., July 19, 1924) first sprinkles a few drops of cologne water on the mask, starting with the anesthetic a minute or 2 later. Nearly always the induction is rendered easy and quiet, and often the entire course of the anesthesia is favorably influenced.

METHYLENE CHLORIDE AN-ESTHESIA.—Methylene chloride is recommended by W. Bourne and R. L. Stehle (Can. Med. Assoc. Jour., June, 1923) for use in labor, as a preliminary to other less agreeable anesthetics, in all minor surgical procedures, for painful dressings and in dental work. An unusual feature of its action is the period of anesthesia without loss of muscular power which precedes the stage of excitement. This period is availed of by administering the anesthetic to the point of unconsciousness and then discontinuing it until the first signs of return of consciousness are seen, when it is renewed.

The procedure is thus 1 of intermittent administration, with avoidance of the stage of excitement, which is attended with violent muscular activity.

LOCAL ANESTHESIA.—A new method of cervical plexus block has been described by W. R. Meeker and H. W. Hundling (Surg., Gyn. and Obst., June, 1924). Recent experience having shown that the lateral direct route entails an element of danger from injury to the vertebral vessels or spinal puncture, they have employed a lateral oblique method 272 times, with satisfactory results. In this procedure the transverse processes are approached from above obliquely downward. A dermal wheal is placed just below the tip of the mastoid process. Infiltration is then carried toward the carotid tubercle for 4 or 5 centimeters, or 2 additional wheals are made about midway down the neck in the mastoid-carotid line, 11/2 centimeters apart. The needle is inserted at the highest wheal and advanced obliquely downward at 45°

with the median plane of the body, while the line of transverse processes is palpated with the left hand. When bony contact is sensed, 5 to 8 c.c. of novocaine-adrenalin solution are injected.

Similar injections are thereafter made at the tips of the 3d and 4th cervical transverse processes from the 2d and 3d wheals. Subfascial fanwise injections are then made in the same plane so as to form a wall of anesthetic fluid from the skin to the transverse processes. On account of the oblique direction of the needle, there is no possibility of entering the intertransverse space.

Institution of a bilateral block of this type proved useful in thyroidectomy, resection of cervical and submaxillary glands, excision of branchial cysts and, in conjunction with block of the laryngeal nerves and deep submaxillary infiltration, in laryngectomy and thyrotomy. Unilateral block proved efficient in esophageal diverticula, osteoplastic flaps in brain surgery, and Gasserian ganglion operations. The writers note that in 5 years local anesthesia in thyroidectomy at the Mayo Clinic, from which their contribution issues, has increased from 2.7 to 29 per cent. in cases of simple goiter.

According to M. Kochmann (Zeit. f. Hals-, Nasen- u. Ohrenheilk., May, 1924), novocaine remains the best local anesthetic when both efficiency and low toxicity are considered, but only for injection anesthesia, cocaine being preferable for surface anesthesia.

As a result of experiments conducted by the writer with Gehse, he advocates the following combination in surface anesthesia:

```
R. Cocaine hydrochloride
(8% sol.),
Phenol (1.4% sol.) āā 25 c.c.;
Sodium chloride
(1.8% sol.) ...... 50 c.c.;
Adrenalin chloride
(1% sol.) ...... 12 to 15 drops (to be added before use).
```

This solution, containing 2 per cent. of cocaine, acts as powerfully as a 10 or 15 per cent. solution without the phenol. For injection anesthesia he advises:

In a study in various mammals of the comparative activity of various local anesthetics in surface anesthesia, their effect on nerve fibers, vessels and the nasal mucosa, their irritant action, influence on the central nervous system and toxicity, A. J. Copeland (Brit. Med. Jour., July 12, 1924) found the best local anesthetics for the eve to be cocaine and Tutocaine may also prove serviceable. Tropacocaine, novocaine and eucaine are less valuable for deep anesthesia. For the nose, cocaine and tutocaine are alone useful. For subcutaneous injection novocaine is much the best. In view of their relatively prominent effects on the central nervous system, the writer believes that butyn and tutocaine may Lecome addiction drugs, like cocaine.

Untoward Effects.—Injecting cocaine and adrenalin in animals as in a routine clinical tonsillectomy, E. L. Ross (Ann. of Otol., Rhinol. and Laryng., Dec., 1923) observed an increase of 223

per cent. in the arterial pressure and of 467 per cent. in the intracranial venous pressure. The circulatory changes being negligible if either of the 2 drugs is omitted, the above marked effects are due to their synergistic action. The systemic effects clinically witnessed are ascribed to an enormous increase in intracranial pressure which causes first a circulatory stasis, then asphyxia of the central nervous system with increased respiration, and finally a smothering sensation. Clinically the maximum rise of blood-pressure averaged 34.2 per cent, and was greatest in the cases showing the most marked reaction. To make this type of local anesthesia safer, measures should be taken to lower, rather than to increase, the blood-pressure. Cocaine should be avoided or, if indispensable, should be applied some time after the injection of adrenalin and novocaine.

From experience in a case of death from novocaine poisoning in an operation for cancer of the tongue, and a study of the literature, R. Eidens (Arch. f. klin. Chir., Jan. 27, 1923) concludes that the dose of this drug used in blocking the nerves in the neck should be materially smaller than in other regions of the body. Intracardiac injection of 1 c.c. (16 minims) of 1:1000 adrenalin solution is suggested for use in cases of dangerous collapse.

In experimental work C. Nielsen and J. A. Higgins (Jour. of Lab. and Clin. Med., Apr., 1923) found pituitary solution the most effective drug in poisoning by local anesthetics of the cocaine group. They think small doses of it injected subcutaneously at the same time as the local anesthetic would eliminate any fall in blood-

pressure from therapeutic doses as well as the convulsions from higher doses and death from fatal doses. High blood-pressure and pregnancy would contraindicate its use.

SPINAL ANESTHESIA.—As noted by J. T. Case (Surg., Gyn. and Obst., July, 1923) spinal—or, as he prefers to term it, lumbar-anesthesia has been gaining in popularity very rapidly in the last few years. In France and Germany it is extensively used. In many clinics all major surgery of the lower abdomen and pelvis is carried out under this form of anesthesia. W. Wayne Babcock (Ibid., Sept., 1923) states that when speed and absolute relaxation are required, spinal anesthesia has the greatest value, though also, from the depression of respiration and the great fall of blood-pressure it causes, it has the largest potential danger. In the hypotension of shock, hemorrhage, toxemia, or asthenia, while the skillful associated use of adrenalized intravenous injections may reduce its dangers, it remains unsafe for general use. The action of 0.15 Gm. of procaine in spinal anesthesia is comparable to that of 0.07 Gm. of tropacocaine, 0.06 Gm. of stovaine, or 0.03 Gm. of butyn; 0.03 Gm. of stovaine yields but about 15 minutes of anesthesia, while 0.06 Gm. of the same drug yields about 90 minutes. Stovaine, 0.06 Gm. in a 4 per cent. solution, injected in the upper lumbar region, will usually produce a fall of 60 to 80 mm. Hg in the bloodpressure; 0.06 Gm. of the stronger butyn similarly injected may cause such a complete vasomotor relaxation that the head and chest must be lowered for 3 hours after the injection to maintain a perceptible pulse at the wrist. The bloodpressure effect depends on the height as well as the intensity of action of the drug. By wise selection of cases and careful supervision the mortality of spinal anesthesia may be reduced to 1 in 10,000 or 15,000. The later secondary symptoms, including headache, have been largely overcome by the use of better preparations and the avoidance of dural leakage by using only needles of small caliber. In such acute infections as pneumonia, nephritis or peritonitis with a septic patient, when the shortest operation with complete muscular relaxation and the least manipulative exposure is desirable, spinal anesthesia is preeminent.

> Hagedorn (Deut. med. Woch., Mar. 21, 1924) believes that general postoperative mortality has been materially reduced by the use of spinal anesthesia. One of its advantages is the absence of postanesthetic intestinal paralysis, the sympathetic plexus not being involved in the action of the drug. He prefers tropacocaine to procaine as the anesthetic. Digalen is always given as a preliminary, and 0.003 to 0.004 Gm. (1/20 to 1/15 grain) of strychnine is injected immediately before the operation, to counteract the usual fall in blood-pressure. Where an unusual fall in pressure is feared, pituitary solution is given prophylactically. After the operation all patients are given saline hypodermoclysis, 11/2 to 2 liters (quarts). If persistent headache occurs, intravenous saline infusion, 11/2 liters, gives prompt relief.

**SACRAL ANESTHESIA.**—Block of the sacral nerves may be effected by: (1) Paraneural injection of the nerves at their exits from the anterior sacral foramina,—a procedure known as parasacral, presacral or an-

terior sacral nerve-block; (2) injection into the epidural space of the sacral canal—epidural, sacral, extradural or caudal anesthesia; (3) injections into the posterior sacral foramina—posterior sacral or transsacral nerve-block.

According to W. R. Meeker and B. E. Bonar (Surg., Gyn. and Obst., Dec., 1923) the best results are obtained with a very low chidural injection for anesthesia of the 5th sacral and anococcygeal nerves, combined with transsacral block of the upper 4 sacral nerves. The first of these 2 steps is effected by injecting 20 to 25 c.c. of a 1 per cent. procaine-adrenalin solution upward through the sacral hiatus (bounded by the 4th sacral spine and the 2 sacral cornua), after making a dermal wheal over this point and infiltrating the subcutaneous tissues and sacrococcygeal membrane. In the 2d step, or transsacral block, a dermal wheal is first placed just lateral to and below the sacral cornu, thus locating the sacral notch in which lies the 5th sacral nerve. For the 2d sacral nerve, the wheal is placed 2½ cm. (1 inch) medial to and 1 cm. (2/5 inch) below the posterior superior iliac spine. The wheals for the 3d and 4th sacral nerves are made at equal distances between those for the 2d and 5th, and the wheal for the 1st sacral nerve at a corresponding distance above that for the 2d, all in the same straight line. For each foramen the needle is inserted perpendicularly to the sacrum, usually meeting the bone at first, then perforating a membrane and advancing further than before. The amounts of 1 per cent. procaine-adrenalin solution injected into the foramina from the 1st to the 5th are, respectively, 7, 6, 5, 4 and 3 c.c. From 60 to 80

c.c. suffice for a complete bilateral block. Anesthesia is usually complete at the conclusion of the last injection, and persists for 2 to 4 hours.

The chief use of epidural anesthesia, according to Meeker and Bonar, in addition to the more superficial operations on the external genitalia, perineum and terminal rectum, is in dilatation and curettage and in urologic manipulative work. For deeper operations on the pelvic floor and viscera the combined low epidural and transsacral method above described is the procedure of choice. It proved sufficient for posterior resection of the cancerous rectum, excision of multiple perineal fistulas and growths of the vulva and vagina, perineorrhaphy, anterior colporrhaphy, vaginectomy, amputation of the cervix, the Watkins interposition operation, vaginal hysterectomy and excision of the cancerous urethra. In obstetrics the epidural method is more practical than the transsacral.

PARAVERTEBRAL ANESTHE-**SIA.**—According to G. Kolischer, A. E. Jones and O. G. Schnetzer (Surg.. Gyn. and Obst., June, 1924) the paravertebral method has proven satisfactory in their hands and those of other American surgeons in about 700 cases, only 4 failures being recorded. There is no mortality from it, and it is applicable in all renal and ureteral operations by the retroperitoneal route. It is particularly indicated in renal cases with pulmonary, circulatory or bilateral renal disorders. The untoward after-effects of general or spinal anesthesia are eliminated. There is no pain in the operative region after the operation, the nerves involved remaining anesthetized for several hours.

nerves blocked in the procedure are the 8th, 9th, 10th, 11th and 12th thoracic nerves near their emergence from the intervertebral foramina. A 1 per cent. **procaine** solution with addition of sodium bicarbonate, potassium sulphate and hydrochloric acid is used.

A more restricted value is ascribed to the procedure by W. R. Meeker (Minn. Med., Mar., 1923), who deems it of limited use in radical removal of the breast and nephrectomy, and most efficient in laminectomy and thoracic operations. Its value is not the same at all levels of the spine, being greatest in the surgery of the pelvic floor and viscera and of the neck, and least in abdominal surgery, in which it has proven unsatisfactory at the Mayo Clinic even in the hands of experts.

The diagnostic value of paravertebral injections of 0.5 per cent. procaine solution in doubtful cases is highly regarded by M. Kappis and F. Gerlach (Med. Klin., Sept. 2, 1923). The visceral nerve-supply of the biliary apparatus and the pyloric and duodenal regions is derived solely from the right side. Pains of purely biliary origin should disappear upon induction of anesthesia of the 9th, 10th and 11th dorsal nerves, while pains of purely gastric origin should disappear upon anesthesia of the 6th, 7th and 8th dorsal nerves. If such disappearance does not take place, the disorder should be regarded as of a different nature, or an additional disorder or complications overshadowing the original disturbance must be present. Pains of renal origin disappear upon blocking the 12th dorsal and 1st lumbar nerves. A therapeutic result is also obtained, such pains generally failing to recur after the anesthetization.

# **SPLANCHNIC ANESTHESIA.**—Further experiences with this pro-

cedure are being reported. Hustinx (Nederl. Tijd. v. Geneesk., Aug. 11, 1923) found the number of cases thus dealt with in the 2 or 3 years preceding his paper to have been 1375, including his own 119 cases. The number of deaths recorded was 4. He regards the Braun or anterior technic as more certain, but the Kappis or posterior method as giving a more widespread anesthesia, including all the viscera above the E. Metge (Deut. Zeit. f. pelvis. Chir., May, 1924), who has used the Braun method in 13 cases and the Kappis in over 250, finds the former too great a strain on the energy and mind of the patient, the abdominal cavity being opened before the mesentery has been anesthetized. Finsterer (Arch. f. klin. Chir., Sept. 23, 1924), however, has used the Braun method successfully in 508 cases, and is convinced that blocking the splanchnics abolishes operative shock and minimizes postoperative pneumonia. Among 62 patients between 60 and 76 years of age in whom gastric resection was performed under this and other local forms of anesthesia there were no deaths from operative shock or pneumonia.

G. Labat (Ann. of Surg., Aug., 1924) deems it undeniable that postoperative morbidity and mortality are greatly reduced by substitution of regional for general anesthesia, and advocates splanchnic analgesia for bad risk patients. It aims to deposit the anesthetic solution close to the splanchnic nerves soon after their passage from the thorax into the abdominal cavity, at the point where they reach the semilunar ganglia. Kappis's method, using the posterior route of approach on both sides of the spinal column, is favored by the majority of observers. The needle is introduced at the lower border of the 12th rib, 7 cm. (21/2 inches) from the midline of

the back, at an angle of 30° with the median plane of the body, and the solution is injected as soon as the needle-point has reached the junction of the lateral and anterior surfaces of the body of the vertebra. Other injections are also made up and down the side of the vertebral The best results are obtained column. when the solution is deposited between the semilunar ganglia and the renal pedicles. An improvement which avoids certain failures of the original technic is to inject, not necessarily 7 cm. from the midline, but at a point at the lower border of the 12th rib which is opposite the upper extremity of the 1st lumbar spinous process. As described by Metge (loc. cit.), 0.0003 to 0.0005 Gm. (1/200 to 1/130 grain) of scopolamine and 0.01 to 0.02 Gm. (1/4 to 1/3 grain) of morphine are injected 11/2 hours before the operation. For the splanchnic injections a 1 per cent. procaine-adrenalin solution is best, about 40 c.c. being used on each side. Careful anesthetization of the abdominal wall and spraying of the peritoneum along the costal arch with 100 or 200 c.c. of 0.5 per cent, procaine solution are also required. The writer employed the method in all extensive operations on the stomach, intestines and biliary tract, in patients ranging in age from 19 to 78 years. It was not used, however, in abdominal wounds, perforative peritonitis, acute cholecystitis, nor ileus. Out of 143 cases, good anesthetic results were obtained in 120, fair results in 5 and insufficient results in 18; in 17 instances general narcosis became necessary for closure of the abdominal wound. While demanding careful selection of cases, the method is regarded as improving the operative mortality in serious operations.

A method of blocking the mesenteric, lumbo-aortic, renal and solar plexuses all by a single injection of anesthetic solution, permitting of operations on the colon, spleen, kidneys, appendix and sigmoid, has been described by M. Roussiel (Presse méd., July 11, 1923). The anesthetic solution, consisting of 40 to 50 c.c. of 0.5 per cent. scurocaine, is injected at the right side of the root of the mesentery where the superior mesenteric

artery leaves the anterior surface of the duodenum to pass between the layers of the mesentery. The solution diffuses along the trunk of the artery to the ileocecal angle and in the retroperitoneal tissues, including the various nerve-plexuses. By pushing the needle further on and upward and injecting more of the solution, anesthesia of the pancreas, duodenum and stomach can also be obtained. The procedure is recommended for the avoidance of operative shock in serious abdominal cases.

## SYNERGISTIC ANESTHESIA.

-Combined use of magnesium sulphate, paraldehyde, morphine and nitrous oxide-oxygen, according to J. T. Gwathmey and G. Schwartz (Med. Jour. and Rec., Jan. 16, 1924), yields complete muscular relaxation with a greater margin of safety than the usual deep 3d stage anesthesia with nitrous oxide-oxygen alone. In the procedure they now nearly always follow, the patient is first given by rectum 200 c.c.  $(6\frac{2}{3})$  ounces of 4 per cent. magnesium sulphate solution with 4 drams (16 c.c.) of paraldehyde, allowed to remain in the sigmoid. Beginning at the same time, 3 hypodermic injections of ½ grain (0.008 Gm.) of morphine are given at 20-minute intervals. At the end of the hour the patient is drowsy, and can be taken to the operating room. For vaginal work no inhalation anesthetic is required, as a rule, but for entering the abdomen a few inhalations of nitrous oxide-oxygen are given. Later the gas may or may not have to be used intermittently. Occasionally, when much traction on viscera is necessary, a little ether may have to be added to the gas. With this procedure morphine postoperatively is rarely needed. There is little intestinal paresis and less acidosis. Nausea and vomiting are practically eliminated, except in cholecystotomy or cholecystectomy. Little ether being used, bronchial and renal irritation are minimized. No distention nor gas pain occurs, and there is total absence of shock or exhaustion. Preoperative emotion is avoided, and upon awakening there is little or no recollection of the operation. During the operation there is no cyanosis at any time.

Gwathmey's method was used in 1000 operations about the head and neck by F. L. Lederer (Amer. Jour. of Surg., July, 1924). Included among the patients, ranging in age from 5 to 68 years, were instances of bronchitis and asthma contraindicating general anesthesia and cases of marked thyrotoxicosis, heart lesions and malignant disease with emaciation. Narcosis being insufficient in 12 per cent., local infiltration or drop ether was added in these cases. There was no stage of excitement, cyanosis, nor loss of body heat; the pulse was somewhat slower than usual, but there was little or no change in the bloodpressure. Nausea and vomiting occurred in 6 per cent. of the cases, but usually not until the patient was moved about. Altogether, the method appeared to be a valuable one.

[See also Abdomen, Surgery of: Anesthesia.]

ANEURISM.—The view that rupture of the intima is not a necessary accompaniment of the formation of an aneurism is supported by a case reported by R. G. Whitman and H. B. Stein (Jour. of Med. Res., Sept., 1924). In a woman of 76 a large aneurismal sac was found at the aortic arch, associated with extensive splitting of the walls of the aorta and its branches, this sac, however, containing only lymph and

showing no evidence of ever having contained any blood. The intima was unbroken. The view of Babès and Mironescu that intramural hematoma is not a necessary feature of dissecting aneurism is also confirmed by this case.

AORTIC.—Symptoms.—The relative frequency of aneurisms in the different portions of the aorta is given by L. J. Boyd (Amer. Jour. Med. Sci., Nov., 1924) as follows: Ascending aorta, 10; arch, 7; upper descending aorta, 3, and thoracic aorta, 1. The condition probably represents the cause of mortality in 0.1 to 0.5 per cent. of deaths in American cities. Studying 4000 reported cases, the writer found pain to be the first and chief complaint in 29 per cent.; it was felt either in the chest, one of the shoulders or in the back. Anginoid pain is apt to occur early in the disease, and as in angina pectoris, often radiates down the arm, with numbness or tingling in the fingers, and is apt to be brought on by exertion. Pressure pain occurs later, when the growth has reached the chest wall. A 3d type of pain is seen in dissecting aneurism, being sudden and terrific, usually with collapse ending in death in the 1st or 2d attack. Dyspnea was the first or chief complaint in 31 per cent. of cases, and cough in 19 per cent. Brassy cough exists only in a minority of cases. Other symptoms found to be common were expectoration, tumor, dysphonia, dysphagia, loss of weight, palpitation, pulsation, cyanosis, ocular phenomena and recurrent laryngeal involvement. Tracheal tug is absent in over 1/2 the cases and may be slightly present in other conditions. Posterior dulness,

though stressed in text-books, was rarely mentioned in the case reports. A bruit is additional evidence, but its absence should not influence the diagnosis. Among the incorrect diagnoses noted in 130 cases, the commonest were as follows: Rheumatism, 32 cases; tuberculosis, 22; asthma, 18; chronic bronchitis, 14; failing heart, 10; mediastinal neoplasm, 10; endocarditis, 4; and angina pectoris, 4.

Referred pains in aneurism are described by A. McPhedran (Can. Med. Assoc. Jour., Feb., 1924). In a man aged 60 there was pain in the lower precordium, apparently from hyperacidity, and increased by exertion. A man aged 70 had occasional pain in the right shoulder and 3d and 4th interspaces, relieved by rest, with a later attack of faintness and finally sudden death from rupture. A younger patient had severe pain over the anterior aspect of the left thigh, referred from pressure on the nerve plexus by an aneurism on the left side of the aorta.

In a case reported by Peters (*Ibid.*, Sept., 1924), a diagnosis of tumor of the spinal cord at the 3d or 4th thoracic segment had been made. The autopsy showed a small aneurismal dilatation bulging into the spinal canal through an eroded area and pressing on the cord.

Diagnosis.—The varying interpretations of X-ray shadows by different observers are alluded to by E. C. Samuel (Amer. Jour. of Roentgenol., Apr., 1924); what appears to one to be a dilatation of the vessel is an aneurism to another. Differentiation of aortic aneurism, dilated aorta and aortitis is, nevertheless, greatly facilitated by fluoroscopy. A sacciform aneurism usually pulsates, though a large one may not, owing to clotting and organization. Care should be taken not to mistake for aneurism a transmitted pulsation from the aorta

to a large group of glands. In cylindric dilatation the thoracic aorta can be seen down to the diaphragm, but below this level the writer finds it impossible to recognize an aneurism with the X-rays. A diagnosis of abdominal aneurism cannot be based on vertebral erosion with severe pain, for a vertebral neoplasm will cause the same manifestations. Nor can calcified plaques be depended on for diagnosis in this region, the writer not having seen any in hundreds of cases. J. Chalier (Rev. de méd., Feb., 1923) notes that sometimes X-ray diagnosis of aneurism of the descending aorta is precluded on account of concealment of the vessel by the heart.

In 8 cases of aneurism of the abdominal aorta, E. Eskuchen (Klin. Woch., Nov. 26, 1923) found the commonest symptoms to be: Pressure sensation in the epigastrium, pain suggesting lead colic, left-sided backache radiating to the testicle and thigh, meteorism, delayed femoral pulse, and a pulsating tumor. Aneurism of the anterior aspect of the abdominal aorta should be thought of in the presence of intestinal pain, slight fever and a positive Wassermann. Methods such as air inflation of the bowel and pneumoperitoneum facilitate the X-ray diagnosis.

Prognosis.—A comprehensive review of the prognosis has been contributed by C. Saloz and E. Frommel (Arch. des mal. du cœur, Sept., 1923). In aneurism of the ascending aorta the commonest termination is by heart failure; in the case of the aortic arch, by asphyxia, generally from pressure on the trachea, and in that of the descending aorta, by rupture

(11 out of 13 cases). Among the entire 69 cases, however, rupture occurred only in 23, viz., 7 times into the respiratory passages, 7 into the esophagus, 5 into the pericardium, and 4 into the pleura or mediastinum. A point brought out is that, whereas rupture into the pericardium, pleura or esophagus is, as a rule, fatal immediately or within a short time, perforation in the bronchi or trachea is often not promptly followed by death, periods of survival ranging from a few weeks to 6 years having been reported. Rupture into the pulmonary artery causes sudden insufficiency of the right ventricle with cyanosis, visceral congestion and diffuse edema, but life may continue for some months. Intercurrent disorders such as pneumonia, meningitis, tuberculosis and urinary affections are causes of death most frequently in aneurism of the arch and ascending aorta.

Treatment.—According to Samuel (loc. cit.), about 95 per cent. of all cases of aneurism yield a positive Wassermann reaction, and even if the reaction is negative, antisyphilitic treatment is advisable. J. J. Conybeare (Guy's Hosp. Rep., Apr., 1924) likewise urges a more extensive trial of vigorous antisyphilitic measures. In a follow-up study, it was ascertained that out of 11 cases of aortic aneurism found living after hospital treatment, 6 had had a series of neoarsphenamin injections to a total of 3 Gm. or more, and that of these, 5 had had hardly any symptoms since and had been working. The average interval since they had left the hospital was 31 months, suggesting that the benefit had been greater than a temporary improvement due to rest. Potassium iodide had also been taken by almost all the cases.

In regard to surgical treatment, Gessner (Ann. of Surg., Mar., 1924) reports 9 cases dealt with by Matas's endoaneurismorrhaphy, including 4 fusiform, 1 false and 4 arteriovenous aneurisms. In 5 instances the obliterative method and in 4 the restorative method was employed. No mortality, complications or recurrences have followed.

J. H. Gibbon (*Ibid.*, Sept., 1924) states that pain and growth of an aneurism are fairly well controlled by rest in bed and constant use of an ice-bag. He urges that intensive antisyphilitic treatment, including iodides in large doses, precede operation, as the results are thereby much improved. The affected limb should be elevated for a few minutes before the sac is opened. Digital compression should alone be used to control the circulation. The Matas operation is deemed by the writer to be indicated in all accessible aneurisms, and should supplant ligation. Of his 21 cases 19 were in accessible regions, vis., femoral, 10; popliteal, 6; femoral and external iliac, 2, and brachial, 1. Three deaths followed operation; in the remainder the results were very satisfactory.

CARDIAC.—According to A. Hanser (Zent. f. inn. Med., July 26, 1924), it is possible to diagnose chronic partial aneurism of the heart during life. An especially important indication is slight fever following attacks of angina pectoris, due to absorption of necrotic muscle tissue. Sternberg has also laid stress on transient symptoms of pericarditis in patients suffering from angina pectoris.

An aneurism of the right ventricle in a man of 42 was discovered with the X-ray by Heitz and Corone (Arch. des mal. du cœur, July, 1923). The symptoms were chronic laryngitis, dyspnea, emphysema and occasional premature contractions. The patient was not a syphilitic. In the X-ray diagnosis of such a lesion, the aneurism should not only be continuous with the cardiac outline from different aspects, but should follow the heart's movements, show an expansile quality, and usually appear less opaque than the rest of the heart.

CAROTID.—In 2 cases of aneurism of the internal carotid of syphilitic origin, Castex (Ann. de méd., Aug., 1924) observed a subjective noise in the ear of the same side. Nieto (An. de la Fac. de Med., Montevideo, June-July, 1922) has reported a case of infected carotid aneurism in which the condition had developed in 2 weeks, with symptoms of abscess in the neck. Ligation of the common carotid yielded completely successful results, without after-effects.

CEREBRAL.—In a case of intracranial aneurism of the internal carotid artery described by Reginald Fitz (Boston Med. and Surg. Jour., Sept. 18, 1924), the patient, a woman of 43, had had 2 attacks of unconsciousness with epileptiform convulsions, blindness in the left eye, and large extravasations of blood in the retina. In the 2d attack lumbar puncture yielded bloody fluid under great pressure, and death occurred in 22 hours, due, as the autopsy showed, to rupture of the carotid aneurism. Though a diagnosis of aneurism had not been made during life, there existed many of the characteristic signs of cerebral aneurism enumerated by Symonds and Cushing: (1) Pressure

signs at the base in the region of the cavernous sinus, viz., pain in the field of the ophthalmic division, exophthalmos, diminished visual acuity, and paralysis of the 4th and 6th nerves; (2) signs of the underlying cerebral arteriosclerosis and, less commonly, infective endocarditis; (3) signs due to blood leakage, as sudden headache or backache, loss of consciousness, bloody cerebrospinal fluid, and often large extravasations in the eyegrounds. Where such manifestations are seen, a diagnosis of cerebral aneurism can logically be made.

GLUTEAL.—In aneurism of the gluteal artery, A. W. Adams (Lancet, Apr. 7, 1923) advises a preliminary ligation of the internal iliac—a harmless procedure which will control hemorrhage from the sac. Then, if the wall of the sac is ill-defined, intrasaccular ligation is best, while if the sac is well-formed, obliterative aneurismorrhaphy is the ideal procedure.

ARTERIOVENOUS.—Some outstanding contributions on the general circulatory changes resulting from this type of aneurism have appeared of late. Thomas Lewis and A. N. Drury (Heart, Oct. 30, 1923) assert that the blood leakage from a large limb artery to the corresponding vein in this condition may amount to as much as 1/5 or even 1/2 of the total quantity of blood thrown out by the left ventricle at each beat. The blood flow through the general capillary bed may be seriously diminished, even to ½ the normal. The heart is apt to enlarge; this is probably chiefly a dilatation, due to deficient nutrition of the heart muscle consequent on the fall of mean arterial pressure. The general circulatory effects of the arteriovenous short-circuit are like those of aortic regurgitation, viz., low diastolic pressure, large pulse pressure, water-hammer pulse, collapsing pulse, capillary pulsation, and a difference in the arm-leg systolic pressures.

According to C. F. Hoover and A. J. Beams (Arch. of Int. Med., Jan., 1924), absence of change in the pulse pressure following digital compression of the fistula is pathognomonic of arteriovenous fistula. Systolic liver pulsation is also an important physical sign, particularly in the absence of enlargement of the right auricle. Systolic excursion of the heart increases in arteriovenous aneurism in order to accommodate an increased minute volume flow of blood, and the heart impulse becomes accessible over the entire precordial Gerlach and Harke (Klin. Woch., May 27, 1924) agree with the view that this condition requires increased work on the part of the heart to maintain the blood-pressure. Making pressure over the aneurism so as to interrupt the abnormal communication results in a rise of blood-pressure and slowing of the pulse, the latter produced through the vagi.

In a case of small arteriovenous aneurism of the axillary vessels reported by A. Cosacesco (Presse méd., Oct. 4, 1924), the aneurism had been getting smaller when first seen by him, and some months later it disappeared entirely. Gradual obliteration of the artery had occurred. Such a termination without treatment is so rare and the risks attending expectancy so great that operation should always be considered indicated.

CIRSOID.—D. C. Elkin (Ann. of Surg., Sept., 1924) reports a case of

cirsoid aneurism following a shrapnel wound of the scalp in which ligation of both external carotids had already been performed. Reflection of the scalp revealing a cavernous angioma, the latter was puckered with multiple sutures and the X-rays later used to promote endothelial destruction and thrombosis, with favorable results.

# ANGINA PECTORIS.—ETI-OLOGY AND PATHOGENESIS.

—The mode of production of this disorder is still a mooted question. No proof has been forthcoming that the cause is the same in all cases; in fact, the later studies would suggest that there may be a number of contributory, if not fundamental, factors. Favorable attention is being given to the postulates of Sir Clifford Allbutt (Lancet, May 5, 1923), that (1) in 90 per cent. of cases angina pectoris is due to disease of the thoracic aorta, and especially of its outer investment, wherein lie the sensory end-organs that regulate the blood-pressures; (2) death is due ordinarily to inhibition through the vagus, i.e., to the shock of the pain; (3) the coronary arteries and myocardium have nothing to do with the pain of angina but much to do with its mortality-in younger persons with healthy myocardium the heart usually survives the inhibition. [An analogy exists herein with the well-known pharmacologic experiment in which the normal heart soon recovers from the inhibition induced by electric stimulation of the vagus, whereas the heart simultaneously depressed by concentrated chloroform vapor is instead permanently arrested by the same amount of vagus stimulation.—Editors]. In persons under middle age angina is mostly of syphilitic origin, probably not mortal unless the heart also be attacked by the infection. Occasional cases occur in other infections, especially influenza, rheumatic fever and malaria. Tobacco angina in its intenser degrees is a rare disorder.

Allbutt's views are endorsed by K. F. Wenckebach (Bull. Battle Creek Sanit., Mar., 1924), who notes that the theory of coronary sclerosis is weakened by the fact that many cases of angina have shown no coronary lesions postmortem while many cases of coronary sclerosis have never had angina pectoris. As for spasm of the coronaries, no definite evidence of such a spasm has been adduced. Wenckebach regards the depressor nerve-a typical sensory, not a sympathetic nerve—which courses within the same sheath as the vagus nerve, as the path conducting pain impulses from the proximal portion of the aorta to the centers. The depressor nerve has its endings in this part of the aorta only.

Daniélopolu (Brit. Med. Jour., Sept. 27, 1924) favors the theory of inadequate coronary circulation, resulting in accumulation of toxic substances which irritate the sensory nerve fibers in the myocardium. So long as the irritation is only slight, there is no pain, but merely reflexes passing along 2 classes of nerves, pressor and depressor. That the pressor reflexes predominate is shown by the pulse acceleration and rise of blood-pressure usually present during attacks. The pressor reflexes, in turn, by increasing the work of the heart, intensify the toxic effects on the myocardium, a vicious circle thus resulting which, when it has become sufficiently intense, induces pain. Motor manifestations-irregularities or arrest—also appear, which he ascribes to changes in the cardiac muscle fibers. S. A. Levine (Jour. Amer. Med. Assoc., Sept. 16, 1922) asserts that almost every angina patient shows postmortem a more or less recent infarction of the heart due to coronary closure. Although an aortitis may well be the underlying cause of the attacks of pain, the prognosis depends on the condition of the coronaries, these cases usually living until one or more coronary arteries become occluded. Sclerosis of large vessels is more likely to be associated with angina pectoris than sclerosis of fine vessels. The average systolic pressure in 99 cases was 160.6 mm. Hg. Two patients showed a distinct increase of blood-pressure with the development of an attack, and a fall in pressure as nitroglycerin made the attack subside. Probably any factor reducing the pressure could end attacks. A distinct incompatibility between angina and auricular fibrillation was noticed in the writer's series; angina cases virtually always have a dominant regular heart rhythm.

Sir James Mackenzie (Lancet, Oct. 4, 1924) laid stress on pathologic changes in the heart-muscle, and discounted the danger attending the pain itself. The latter, he asserted, may be associated with conditions which are dangerous, but such dangers are not reduced by easing the pain.

According to F. A. Willius (Ann. of Surg., Apr., 1924), the syndrome angina may result from obliterative coronary dis-

ease, aortitis, aortic valvulitis, aneurism, adhesive pericarditis, or occasionally mitral stenosis. In 86 necropsies at the Mayo Clinic in which coronary sclerosis was found, the gall-bladder was diseased in 24 per cent. Patients with angina of coronary origin present little or no evidence of heart disease. Considerable coronary sclerosis may be present with little impairment of cardiac circulation, obliterative degeneration of either the larger or terminal arteries being the cause of trouble.

W. D. Reid (Arch. of Int. Med., Aug., 1924) adduces evidence to the effect that in the normal adaptation of the circulation to exercise there occurs a peripheral vasodilatation, the result probably of a reflex through the depressor fibers of the vagus nerve. This serves as a protective mechanism, permitting the heart to contract without strain. The essential feature of angina may be a failure of this mechanism, due to pathologic changes in the aorta and ventricular muscle or change in the peripheral vessels or both; there would then result on exertion a sudden rise in the aorta and left ventricle, with irritation of the sensory terminals and referred pain.

In statistics of 450 cases of angina induced by exertion, Gallavardin (Presse méd., July 16, 1924) found the condition to be of syphilitic origin in all cases in which it was combined with aortic aneurism, in 90 per cent. of cases with aortic insufficiency and in 33 per cent. of cases without aortic disease, but below 50 years of age. Further statistics showed that tobacco is not the cause of the majority of cases of non-syphilitic angina pectoris. Yet, undoubtedly some patients are unfavorably affected by tobacco fumes; tobacco should therefore be forbidden these cases.

DIAGNOSIS.—The "precordial area" of angina, according to Allbutt (loc. cit.), is a figment of the text-books, the primary seat of the pain being usually substernal, generally under the upper ½ of the bone. In a few cases it falls to the lower sternum or epigastrium. This point serves in the differentiation of angina proper from tobacco angina, as does

also the writhing, tossing and pacing of the tobacco patient, whereas in angina proper the sufferer is held in awestricken arrest. A third point is that normally in the tobacco cases the heart is irregular, e.g., with extrasystoles. In pseudo-angina there is an actually precordial ache or pain, restlessness and writhing, flushed face, a rapid throbbing heart-action, often with irregularity.

The slighter degrees of true angina are common, and not infrequently the patient lives to die of some other disease. Among the many eccentric manifestations are epigastric pain suggesting flatulence or gall-stones, and pains in one or both elbows or hands on sharp walking or ascents. Some elderly persons feel a substernal oppression on walking quickly, but notice no difference between level ground and steep ascents or stairclimbing, and although the oppression is worst after meals, it is highly capricious in advent, often disappearing for long periods; these cases are not to be regarded as true angina. Attacks of genuine angina sometimes occur in conditions with high blood-pressure, e.g., in hyperpiesia; in these cases the prognosis is rather less grave, as the aorta is likely to recover if the blood-pressure can be reduced by rest in bed for a week or 10 days, diet and other A sudden dyspnea on remedies. mounting a hill or stair is not evidence of angina.

In patients under 40 or 50 with upper thoracic pain, the 2d right interspace and manubrium should be percussed carefully for dulness, the Wassermann test employed and fluoroscopy of the aorta carried out; one may thus be able to anticipate

and by specific treatment prevent extension of an aortic lesion to the valve.

[See also CORONARY THROMBOSIS, this Volume.]

PROGNOSIS.—Wenckebach (loc. cit.) notes that in a number of cases there may be dyspnea complicating the angina, even in the beginning. In such cases one may readily believe that there is coexisting serious coronary disease or other disease of the heart which makes the strain thrown on the heart-muscle by the anginal attack too great and finally results in cardiac asthma. Many patients alternate between cardiac insufficiency and angina: If the former is untreated, edema, enlarged liver, etc., appear. If digitalis is given there is diuresis, the lungs become much clearer and the patient feels well for some days; but then the digitalis has to be stopped because the anginal pains return. Such cases often die of typical heart failure and not angina.

In another group of cases there is a sudden, severe and prolonged anginal attack, after which the heart seems damaged, with resulting general weakness, dyspnea, pronounced abnormality of the electrocardiogram, etc. These are cases of coronary thrombosis (q.v.) or embolism.

Willius (loc. cit.) states that often the electrocardiogram reveals changes of much diagnostic and prognostic significance. The most important and common are T-wave negativity and inversion in certain derivations of the electrocardiogram. Next to these is an aberration of the QRS complex affecting all derivations. These changes both entail a high and early mortality. Surgical intervention is permissible in such cases only when imperative, as in operable malignant

disease, strangulated hernia, acute visceral perforation, and the like. Preoperative cardiac preparation is advisable where, with a failing myocardium, surgery is not urgent.

According to A. Blackhall-Morison (N. Y. Med. Jour., May 2, 1923), a notable reduction in blood-pressure after anginal attacks, with the systolic approaching the diastolic, indicates probable early death. Arrillaga (Semana med., Apr. 3, 1924) likewise regards the pulse pressure as of prognostic value. A case with 110 mm. systolic and 100 diastolic died the same night, while one in which the pulse pressure rose under treatment from 20 to 50 mm. was able to resume an active life. prognostic factors are: Age, the pulse (unfavorable if alternating), the condition of the aorta and peripheral vessels, and the electrocardiogram.

TREATMENT.—In a general discussion of the medical treatment, J. Hay (Lancet, Nov. 8, 1924) advises rest in bed for a month, except in the mild cases. Hypertension, if present, should be reduced. The patient's mode of life should be readjusted to the existing needs. syphilis is suspected, especially if the Wassermann is positive, mercurial inunctions, potassium iodide, 10 to 15 grains (0.6 to 1 Gm.) thrice daily, and a course of arsphenamin injections are indicated. The diet should be small in amount, with reduction of meats and avoidance of excess of starchy foods or vegetables promoting flatulence. A blue pill once a week or calomel fractionally in short courses with a regular morning saline is advisable. For intestinal flatulence dimol in capsules or sodium acid sulphate, 10 to 15 grains (0.6 to 1 Gm.), are useful. The stomach should not be overloaded, and rest after meals is indicated. Mild exercise in favorable weather is desirable, but the patient must slow down or stop at the first indication of substernal discomfort. In the many cases resulting from prolonged overwork, worries, etc., ammonium bromide, 20 grains (1.3 Gm.) thrice daily, is of undoubted value, especially in the first month or 2. Iodides, if tolerated, should be given a fair trial in the presence of arteriosclerosis; they are usefully combined with bromides, arsenic and belladonna. Theobromine, either pure, 5 grains (0.3 Gm.) 4 times daily, or as the sodiosalicylate, 10 grains (0.6 Gm.) 3 or 4 times daily, appears to diminish the liability to pain. If there is any tendency to anemia or general debility, simple hematinics with arsenic undoubtedly benefit when taken persistently. Diathermy frequently reduces the frequency and severity of the attacks, in a dose of 700 to 1500 ma. for 20 to 30 minutes twice or thrice a week, with the electrodes on each arm or over the precordium and between the shoulders. In incipient substernal discomfort a tablet of nitroglycerin slowly chewed frequently aborts the attack; this procedure is also advisable prophylactically before going out into cold air.

In the attack, if amyl nitrite fails, morphine should be given in sufficient doses, with atropine, ½0 grain (0.0012 Gm.). It is essential that the pain be eased. In persistent angina the effect should be sustained with opium as a draught. Chloral hydrate, 10 to 15 grains (0.6 to 1 Gm.), combined with this draught, is also useful, or it may be taken twice a day instead of the opium for a few days

at a time. Chloroform anesthesia is justifiable for pain resistant to morphine. Early in the attack, brandy or whisky only slightly diluted may be followed by eructation and relief. The following is often more efficient:

R. Mentholis ...... gr. viii (0.5 Gm.);

Spts. ammon.

aromat.,

Spts. chloroformi,

Tr. zingiberis, . āā fǯi (30 c.c.).

M. Sig.: Two teaspoonfuls in water taken as strong as possible.

According to A. Theohari (Arch. des mal. du cœur, July, 1923) theocin (Theophyllina, U. S. P.) eliminates or greatly reduces attacks of angina due to aortitis, whether of syphilitic causation or not. It seems to reduce sympathetic irritability and the activity of the chromaffin system. The dosage is 0.4 to 0.6 Gm. (6 to 9 grains) daily, in 2 or 3 capsules of 0.2 Gm. (3 grains) each. As the uncombined drug is relatively insoluble, its effect is exerted gradually. The dosage mentioned acts best and should not be exceeded. Dizziness and heart acceleration may result from 1 Gm. (15 grains) a day. The drug is best given in 10-day periods, with intervening periods of rest of 10 or 20 days. It reduces blood-pressure by 20 to 60 mm. Hg, not necessarily causing diuresis; its intermittent use as specified may keep the pressure continuously low. Experiments with theocin sodium acetate in animals showed that the blood-pressure is reduced by an action on the sympathetic structures in the abdomen.

R. H. Babcock (Jour. Amer. Med. Assoc., Jan. 19, 1924) used benzyl benzoate in about 20 cases of apparently typical angina pectoris. Of those kept under observation, at least

6 were so distinctly relieved as to justify daily use of the drug for months. The dose was generally 30 drops, poured directly from the bottle into milk or cream, 4 times daily. It did not seem to disturb the stomach, and no other harmful effects were observed. In some cases little if any benefit resulted, notably in 1 of syphilitic aortitis with free regurgitation. The drug seems to be effective in the cases in which vascular tension or spasm so raises intra-aortic pressure as to pinch the nerve-endings in the aortic coats. In a stiffened, inelastic aorta, sharp increases of pressure are not passed on along the course of the vessel as normally. Under benzyl benzoate vascular spasm is doubtless prevented or kept down sufficiently to obviate a pain-producing tension in the discased vessel.

> According to L. T. Thorne (Pract., June, 1924), angina pectoris can be practically cured in its early stages and kept in abeyance later by balneologic treatment. He reports having completely arrested such cases by giving 1 or more courses of artificial "Nauheim" baths. In most cases the 2d course is required after the lapse of some years; as a rule, it produces a still more lasting result than the first. He thinks balneologic treatment may even establish a healthier condition of the aorta and coronaries, just as it restores or improves joints with organic chronic inflammation. The baths are stated to produce dilatation of all the skin vessels, a drop in blood-pressure, and a relief of vascular spasm much more lasting and general than the nitrites, without any of the disagreeable head fulness, throbbing and headache; they also slow and strengthen the heart's action. The improved circulation promotes elimination of the toxic material underlying the trouble. Two illustra

tive cases from among many are given. One man aged 64 had had occasional attacks for some years and was seen in a severe attack which so prostrated him that he remained in bed 2 weeks. When he was strong enough a course of the baths was started in his home. In the subsequent 5 years he did not have the slightest return of the pain, though leading a strenuous life. In the other case, aged 69, the course of baths climinated the pain previously felt on slight exertion or exposure to cold and greatly reduced the breadth of cardiac dulness. No return of pain occurred for 7 years. E. Guilleaume (Arch. of Med. Hydrol., May, 1924) advocates natural effervescent baths as a potent aid in angina pectoris.

Allbutt (loc. cit.) notes that Vernon has given relief in many cases of angina by artificial deflation of the stomach. He doubts, however, that all these were cases of true angina. Poulton has shown that a rubber bulb inflated in the esophagus gives rise to a substernal oppressive pain.

Surgical Treatment.—An extensive literature on this topic has been accumulating of late. As Mackenzie (Lancet, Oct. 4, 1924) said, the aim of the surgical procedures is not to cure the disease but, by cutting the nerves conveying impulses from the heart to the central nervous system, to prevent the sensation of pain.

The operation performed for the first time for this disease in 1916 by Jonnesco and reported by him in 1920 was a resection of the left sympathetic from the base of the neck into the thorax, including the last 2 cervical ganglia and the 1st thoracic ganglion. The patient had no further attacks in the 4 years following operation. More recently, Jonnesco (Presse méd., Feb. 13, 1924) has reported on a total of 6 cases of angina treated by this operation, performed

either on 1 or both sides. Two were chronic heart cases with loss of compensation, and these both died 4 days after the operation. In the other 4 the anginal symptoms were accompanied by little or no cardiac impairment. Of these, 3 (including the original case) were cured, while the 4th died 8 months after operation —this death being ascribed to lack of proper instrumentation at the time of operation. The experience with the 2 fatal cases shows, he states, that the operation is inadvisable unless the heart is in a sufficiently good condition. Aside from this, no disturbances of the heart or lungs were observed following the operation. If complete relief is not obtained from unilateral operation, the procedure may be repeated on the other side.

W. B. Coffey and P. K. Brown are inclined to believe that equally good results are obtainable with a less extensive operation, viz., section of the left sympathetic trunk below the superior cervical ganglion, and of the superior cardiac branch, with or without removal of the ganglion itself.

These authors (Arch. of Int. Med., Feb., 1923) describe the operative procedure substantially as follows: The incision is made at the posterior border of the sternocleidomastoid muscle, from the mastoid process to where the external jugular vein crosses the muscle. To extend it, this vein can be ligated, the branches of the superficial cervical plexus severed, and the incision passed through the border of the muscle. Usually, to avoid the auricular and occipital nerve branches, the musclefibers are separated near the posterior edge of the muscle. The posterior sheath is then opened, a space cleared with blunt scissors and fingers, and the exposed neurovascular bundle (jugular, carotid,

vagus, phrenic and branch of hypoglossal) retracted mesiad, exposing the vertebral plane. The superior cervical ganglion (fusiform in shape) is then carefully sought at the upper end of the operative field. At the lower end of the field the cord from the ganglion is isolated and severed; likewise the cardiac branches. For removal of the ganglion, the latter is elevated, the branches along its 2 borders cut with blunt scissors, and then the cardiac trunk below and the cranial branches above. Lastly, it is seized with a hemostat and pulled from its cranial attachment. The wound is closed without drainage.

In their original group of 5 cases, Coffey and Brown removed the superior cervical ganglion only in 1 instance. Two cases were presumed to be due to syphilitic aortitis. Death a few hours after operation occurred in 1 case, while marked relief from the pain was noted in the remaining 4.

Tuffier (Bull. de l'Acad. de méd., July 26, 1921): Operation similar to Jonnesco's, in a man aged 50. Attacks of angina relieved.

Pleth (Amer. Jour. of Surg., Dec., 1922): Four cases of Jonnesco operation on the left side, with complete relief of pain. One patient died, however, of aspiration pneumonia.

Brüning (Klin. Woch., Apr. 23, 1923): Removal of all 3 sympathetic cervical ganglia and of the upper thoracic ganglion, in a woman of about 60 years. Anginal attacks ceased and the high blood-pressure was lowered.

Brown (Jour. Amer. Med. Assoc., June 9, 1923): Removal of the right superior cervical ganglion in a man with decompensation, auricular fibrillation, dyspnea and severe attacks of pain, mainly right-sided, the first possibly due to coronary blockage. Operation under gas-oxygen with a little ether. Freedom from all distress for nearly 2 months; able to walk 4 or 5 blocks a day without dyspnea or pain.

Then, influenza, bronchopneumonia and death.

Kappis (Med. Klin., Dec. 30, 1923): Removal of the 3 left cervical ganglia and the 1st thoracic ganglion in a woman of 62 with systolic pressure of 200 mm. and diastolic, 170 mm. Only the pain in the left arm was permanently relieved, attacks of substernal pain recurring upon exertion 4 months after the operation.

Borchard (Arch. f. klin. Chir., cxxvii, 312, 1923): Combined resection of the upper ganglia and the depressor nerve in a man of 54 with good heart action. Anginal pain disappeared after 4 days, but death occurred within 3 weeks, after symptoms suggesting arterial occlusion in the left fossa of Sylvius.

Kohler and von der Weth (Zeit. f. klin. Med., xcix, 205, 1923): Left cervical sympathectomy in a case with severe anginal attacks associated with acute rises of blood-pressure. Results good and the rises of pressure abolished, but there remained a persistent Horner's syndrome, lowered intraocular pressure, and tendency to local hyperemia on the left side.

Bacon (Jour. Amer. Med. Assoc., Dec. 22, 1923): Removal of the left superior ganglion, with its attachments, under 1 per cent. procaine anesthesia through a 3 inch incision of the anterior border of the sternomastoid, in a man of 78 years. Complete relief from severe symptoms, with reduced diameter of the aorta disclosed by teleröntgenography.

Odermatt (Schweiz, med. Woch., Jan. 10, 1924): Section of the nerve anatomically regarded as the depressor in a man of 65. The attacks ceased, but the man died from progressive cardiac insufficiency 2 weeks after operation.

Diez (Rev. de la Asoc. méd. Argent., June, 1924): Three cases dealt with by Jonnesco's technic. Good results in all, especially in a man aged 43, with angina of 11 years' standing, who was enabled to walk 11 miles at a stretch without pain or dyspnea. All cases had local hyperesthesia for 3

months after operation. Procedure of Coffey and Brown regarded as insufficiently extensive for best results.

Eppinger and Hofer (Wien. klin. Woch., xxxvi, 334, 1923): Summary mention of 6 cases in which the depressor nerve was divided on 1 or both sides (3 each). Four were completely relieved, 1 doubtfully so, and 1 died of bronchopneumonia, accidental section of the superior laryngeal nerve and tracheotomy.

Jennings, C. G. and A. F. (Med. Jour. and Rec., Oct. 1, 1924): Excision of 3 inches of the left sympathetic nerve (no ganglion found) under ethylene anesthesia in a man of 41 with arterial hypertension and history of right-sided hemiplegia. Temporary numbness and pain in the shoulder and behind the ear, due to stretching of other nerves. No painful anginal attacks in the 2 months following operation, though in the first 2 weeks there were 3 attacks with the symptoms of angina other than the pain.

Brown and Coffey (Arch. of Int. Med., Oct., 1924): Eight additional cases of the writers' method of sympathectomy, including removal of the superior cervical ganglion. Two patients died of heart-failure, 1 a few hours and the other 2 weeks after operation; both had low blood-pressure and large, flabby hearts. The other 6 patients were restored to comfort and some degree of usefulness, depending on the underlying heart condition. One patient, however, has pain in the region of the heart apex and left scapula on exertion. The writers also report 7 cases operated by other observers, all of which were relieved of the substernal agony, though in 1 case persistent pain on the left side of the head, neck, shoulder, breast and part of the upper arm developed, together with recurrent anginal seizures.

The main *indications* for operation in angina pectoris are given by F. J. Smith and R. D. McClure (Surg., Gyn. and Obst., Aug., 1924)—who

report 2 cases—as follows: (1) Frequent, severe attacks necessitating the giving up of occupation and not yielding satisfactorily to medical measures; (2) a feeling on the part of the patient that the painful attacks provide an intolerable situa-The main contraindication is existing or impending myocardial insufficiency. An objection to the depressor nerve operation is the difficulty of identifying it; it is included in the vagus nerve and leaves it at a rather inconstant level as an inconspicuous nerve filament; there is also a risk of injury of the superior laryngeal nerve, from which these fibers often branch, necessitating tracheotomy. The Jonnesco operation is simpler and more generally useful, and though promptly followed by the characteristic enophthalmos, myosis and occasionally transient conjunctivitis on the operated side, offers a decided probability of considerable relief from pain and return to gainful occupation. Whether life can be prolonged and cardiac efficiency improved is another matter; many believe that this is the case. Complete relief from pain should not be counted on unless the 1st thoracic ganglion is included in the resection.

Mackenzie (Lancet, Oct. 4, 1924) disapproved of the operation for angina pectoris on the ground that by annulling the pain, it removes a valuable subjective danger signal which leads the individual to spare the weakened heart-muscle overexertion and thus tends to preserve its efficiency. This feature is recognized in the remark of Smith and McClure (loc. cit.) that these patients should be frequently observed after operation and strictly enjoined against

overexertion. Mackenzie also argued that in angina the pain itself is in no sense a dangerous symptom. this he apparently contradicted the postulate of Allbutt that death in angina is frequently due to cardioinhibition through the vagus, i.e., to the shock of the pain. In this connection the following statement of Brown and Coffey (loc. cit.), founded on their operative experiences, is also possibly deserving of mention: One fact stands out clearly, viz., that the substernal pain is a spasm of the 1st part of the aorta where the superior cardiac branch is largely distributed, and it is the vasoconstrictor influence of this nerve, not only to the aorta but the coronaries which it also supplies, that is responsible for the main symptom of angina. Death occurs when this constrictor action on both aorta and coronaries deprives the heart of blood, and this effect is contributed to by sclerosis of both the aorta and the coronaries.

If either Allbutt's or the latter conception, or both, correspond to actual occurrences, the operative treatment might be conceived of as preserving the patient from an earlier death through cardiac arrest by exaggerated nervous reflex action or some species of a vicious circle involving both the heart itself and its nervous connections.

Daniélopolu and Hristide (Bull. Soc. méd. des hôp., Jan. 25, 1923) assert that the pain component of the anginal attacks can be eliminated by suppressing conduction through the spinal nerves. In 1 case they anesthetized the 2d and 3d left dorsal spinal nerves in the intercostal tract and the rami communicantes with 0.08 Gm. (1¼ grains) of procaine. Half an hour later the patient, previously suffering painful attacks on the least exertion, went

through a number of physical exercises, which increased the heart-rate from 84 to 140 and caused marked dyspnea and palpitation, but no pain. Next day the anginal attacks were painful as before. writers conclude that the pain of angina is exclusively a transmitted pain, conveyed to the skin areas of the same spinal segments as supply the heart and aorta, while the other sensory impulses from the heart are not entirely thus transmitted, since the patient still experienced them during the anesthesia of the spinal nerves. would favor resection of the posterior roots of the 8th cervical and 1st, 2d, 3d and 4th dorsal nerves as a substitute for sympathectomy, possessing over the latter the advantage of not disturbing the motor nerves of the heart.

The above principle has been applied by F. Brunn and F. Mandl (Wien. klin. Woch., May 22, 1924), who instituted paravertebral anesthesia in 6 cases for the relief of anginal attacks not amenable to vasodilator agents such as amyl nitrite, papaverine, novatropine and heat. The injections were made in the 1st to the 4th dorsal segments. In all instances the pain was relieved, though in 3 dyspnea was also produced, apparently owing to the blocking of the bronchodilator sympathetic fibers at the 4th dorsal. The procedure being comparatively free from risk, they advise its use before operative treatment is resorted to.

ANGIOMA. —All angiomas should, according to S. F. Stewart and M. E. Bettin (Surg., Gyn. and Obst., Sept., 1924), be regarded as potentially malignant by extension. A previously painless tumor of the soft parts of the body wall or extremities which suddenly becomes painful should suggest, as one of the possibilities, an angioma invading the peripheral nerves. Prophylactic destruction of angiomas as soon as recognized is advisable; the younger the child, the more favorable the prognosis. Elevated growths yield to freezing or radium. In the cavernous type, complete excision is best; in the racemose type, ligation or, preferably, excision. The authors report a case of multiple angiomas of the internal popliteal nerve and other soft tissues of the left leg in which pain and functional disturbance were such as to require amputation. Deep radiation in infancy, they aver, might have avoided the loss of the limb.

According to H. Krüger (Zent. f. Chir., Nov. 17, 1923), skin angiomas can be eliminated by puncture followed by application of 1 or 2 drops of collodion. The latter, contracting, prevents return of blood into the tumor. This method was used with success in a child with multiple angiomas in different parts of the body, some of the size of a fingernail. A drop of collodion was applied to each every 2 or 3 days, and at 6 months no signs of the tumors remained.

ANILIN POISONING.—The risk attending the breaking off of tips of indelible pencils in the tissues is emphasized by P. Bull (Norsk Mag. f. Laegevid., Mar., 1923). Serious untoward consequences are avoided only by early excision of the tissues in which the pencil tip is embedded, the anilin dye in the lead otherwise diffusing persistently through the body for months and causing toxic effects.

H. J. Cronin (Boston Med. and Surg. Jour., Oct. 9, 1924) states that anilin has been largely discarded in the rubber industry, in which it was much used as a rubber catalyzer, but occasional cases of poisoning still occur, with blueness of the face and mucous membranes a striking symptom. Mild cases should be sent into the fresh air. In severe cases, oxygen inhalations, rest in bed until the blueness subsides, then a long stay in the open air are necessary. Later, iron and tonics are useful. In chronic cases blood transfusion is sometimes employed in addition.

ANKLE, -FRACTURES. -The term "Pott's fracture" is regarded by J. H. Stevens (Surg., Gyn. and Obst., Feb., 1924) as including all eversion fractures at the ankle rather than a special, relatively uncommon variety. He divides the eversion fractures into 5 types: (1) Simple periosteal tear of the internal lateral ligament (rare); (2) fracture of the external malleolus alone half way between the joint surface and the tip (rare); (3) fracture of the internal malleolus; (4) fracture of the fibula alone; (5) fracture of the fibula and internal malleolus. Out of 249 ankle injuries, 55.4 per cent. showed fracture of the fibula alone; 20.9 per cent., of the fibula and internal malleolus, and 14 per cent., of the internal malleolus alone. Inversion fractures occurred in 13.6 per cent. of the 249 cases. Total dislocation of the ankle was present in 34.9 per cent.

The majority of fractured ankles are not as serious as is generally supposed. Poor results have been due to immobilization and misdirection of effort. Motion, active and passive, from the very beginning, is required, and the surgeon should devote 20 minutes a day to this. Reduction where there is dislocation is usually easy. Account should be taken of the fact that even in the simple cases of fractured fibula from eversion there is apt to be posterior displacement of the lower fragment and of the astragalus. With the knee flexed, the lateral displacement is first corrected by rocking the foot, and the posterior displacement then dealt with by a strong forward pull on the tuberosity of the os calcis. with counterpressure against the intact tibia above, carrying the foot

into hyperdorsal flexion. If the internal malleolus is intact splinting in adduction is best. For the emergency the writer uses a pillow splint tied with tapes and reinforced with pieces of splint wood or board, internal, external and posterior. Below the foot, the open ends of the pillow case are folded and pinned to keep the foot hyperdorsiflexed. the X-ray shows a satisfactory position, a Cabot splint is put on, always with the knee bent. If the internal malleolus is broken, inversion is omitted; in a few cases, with difficulty of reposition, Magnuson's ivory pin through the malleolus is ideal. Several pillows are placed under the knee. Daily passive and active motion is usually begun by the 3d or 4th day, and nearly always by the end of the 1st week. An arc of 20 degrees suffices at first. The patient is made to dorsiflex his foot strongly, while plantar flexion is never carried to extremes, especially in the presence of posterior splits. After the first few days the simple cases are soaked in very hot water before the exercises. After the 10th or 12th day a plaster cast or molded leather is used and the patient goes about on crutches. In the serious cases weight-bearing is not allowed before 6 weeks.

TUBERCULOSIS.—Reviewing over 300 cases of tuberculosis of the ankle-joint and tarsus, H. J. Fitz-simmons (Boston Med. and Surg. Jour., Dec. 7, 1922) favors conservative treatment of these conditions in children. Deformity is not decreased and motion is not preserved by operation. Incision toward the supposedly affected bone or joint has not been of benefit. The operated

cases followed by the quickest healing and usually by the best surgical results were those of small incision of an abscess about to rupture spontaneously. Local rest by fixation, with protection against strain and mechanical pressures, should be rigidly enforced. Heliotherapy definitely aids before as well as in the presence of sinuses. Many cases get good functional results with little deformity under non-operative treatment. There is more danger of secondary involvement and general tuberculosis following operations than without.

ANKYLOSIS.—Progress is steadily being made in the operative mobilization of ankylosed joints. The preferable procedure is arthroplasty, which, as defined by W. C. Campbell (Jour. Amer. Med. Assoc., Sept. 27, 1924), aims to reconstruct the component parts of a normal joint, and is thus to be clearly distinguished from excision, or the removal of a mass of bone to produce pseudarthrosis. Efforts are to be directed, however, not toward reproducing mere anatomic detail, but in particular the function of the parts. The operation is rarely, if ever, permissible except when ankylosis has been caused by trauma or acute in-The joints refectious arthritis. sponding the more favorably are, in the order of their chances of success, the elbow, jaw, knee and hip. In the knee, 1 large condyle and 1 shallow concave tuberosity will secure a satisfactory hinge joint. Free fascia lata is now by far the most commonly employed tissue for interposition between the raw surfaces. Analyzing 110 personal cases of arthro-

plasty, the writer notes 14 at the elbow, of which only 3 were failures, all of these in children. Of 23 arthroplasties of the hip, 7 were followed by relapse of fusion, though in 5 of these the position was improved. One death occurred from lighting up of a latent streptococcus infection. Good results may be expected in 60 per cent. of well-selected single hips. In the case of the knee the chances of success, as shown in 59 cases, are 75 per cent. In knee cases with weak muscle power, atrophic changes and flattening of the articular surface after operation can be avoided by intensive muscular training, physiotherapy and gradual increase in weight-bearing by the aid of the Thomas caliper splint.

F. D. Dickson (South. Med. Jour., Dec., 1923) stresses the value of an ample incision and of the removal of enough bone for free, unobstructed motion. As an interposing flap he prefers a free fascia lata transplant to Baer's chromicized pig's bladder or the silver impregnated fascia of Allison and Brooks. In the aftertreatment, 2 plans are feasible: (1) Immobilization in plaster for 3 or 4 weeks, followed by passive and active movements; (2) immobilization by traction, and early motion. The second plan gives the better results.

ELBOW.—In arthroplasty of the elbow, W. R. MacAusland (Surg., Gyn. and Obst., Sept., 1923) makes a semicircular incision beginning over the external condyle, coursing downward about 2 inches, then up over the internal condyle. The ulnar nerve having been dissected out of its sheath and retracted with gauze, a transverse, curved incision is made lower through the periosteum, separating another flap which is later to cover the joint. The olecranon is

sawed through, and if ankylosis is bony and the joint cavity obliterated, likewise the joint. The edges of the humerus are snipped off, a new trochlear or intercondylar surface formed, using a shoemaker's rasp for form adjustment, and a new olecranon fossa in the humerus carefully prepared. Only enough bone is removed to give free motion. A flap of fascia lata 5 to 7 inches by 4 to 5 inches is next dissected from the outer side of the thigh, a little below its middle, and attached anteriorly to the elbow capsule and posteriorly to the periosteum of the lower end of the shaft of the humerus with interrupted chromic catgut No. 2. The same material is then loosely wound twice around the shaft just below the interrupted suture line. drill holes are made in the olecranon and 2 others opposite them in the shaft of the ulna; through these kangaroo tendon is passed and tied. The covering layers are finally sutured and the arm put up in plaster beyond a right angle. Massage is begun after 3 weeks and baking after 6 weeks.

KNEE.—In arthroplasty of the knee MacAusland (loc. cit.) follows Putti's technic with the exception that he avoids severing or disturbing the patella tendon or its attachment. For better joint exposure he elongates the quadriceps tendon. A welldefined spine between the tibial condyles is left, to help stabilize lateral mobility, and the opposing surfaces are carefully molded with Putti instruments and a shoemaker's rasp. A large piece of thick fascia lata is sewed around the condyles of the femur. Active motion can be begun about the 10th week.

In knee ankylosis with genu valgum or genu varum W. Porzelt (Zent. f. Chir., May 26, 1923) recommends Iselin's procedure of osteoplastic knee resection, in which a bone wedge obtained at the apex of the angle of curvature is implanted on the opposite side to prevent further shortening.

**METACARPOPHALANGEAL** JOINTS.—Stiff hyperextended metacarpal joints usually yield, according to C. H. Heyman (Surg., Gyn. and Obst., Oct., 1924), to prolonged massage and manipulations, or to constant traction and flexion with Danforth's banjo splint. Some cases, however, resist all forms of conservative treatment. Excluding cases with destruction or disease of the cartilage itself or with injury to the tendons, flexion is prevented by a thickened and contracted joint capsule. Accordingly, the writer's procedure is to make a longitudinal incision 1 inch long over the dorsal surface, retract the extensor tendon to 1 side, and incise the capsule transversely near its proximal attachment. The proximal phalanx is then forcibly flexed to 90°, the subcutaneous tissues and skin separately closed, and a firm bandage applied over a voluminous dressing holding the metacarpophalangeal joints in extreme flexion. The wrist is held in dorsal flexion with a long strip of adhesive. Two days later, all dressings but a small gauze strip are removed and movements begun, with daily massage of the muscles. A modified banjo splint is then used, consisting of a 3 inch section of automobile inner tube fitting around the upper forearm to which are attached by hooks elastic bands fastened to each of the fingers. With the fingers thus held in flexion by the bands, the patient extends and flexes the wrist at various times during the day, thus passively manipulating the metacarpophalangeal joints.

ANOREXIA NERVOSA.—The basal metabolism was found below normal, ranging from 73 to 82 per cent., in 4 women with pronounced anorexia and loss of weight seen by E. Möller (Ugeskr. f. Laeger, Feb. 14, 1924). They had fasted for 14 or 15 hours previous to the test. All were sensitive to cold, had a slow pulse, and suffered from constipation and amenorrhea. A number of indications of endocrin disturbance were found. Psychic factors were discovered in 2 instances. Hospital treatment was given. One case showed a rise in the basal metabolism to above normal in conjunction with the return of appetite under insistent feeding with a generous diet. Allusion is made to Plummer's view that a secondary hypothyroidia occurs in cases of inadequate food intake with lowered metabolic rate.

TREATMENT.—B. Myers (Pract., Nov., 1924) refers to the nervous anorexia of temperamental children, some of whom ultimately show definite signs of hysteria, asthma, epilepsy, etc. The motive in refusal of food is frequently that the child feels and enjoys its power of causing a sensation and creating anxiety in the household. The child should first be examined thoroughly to exclude organic trouble. The condition and treatment should then be explained to each parent. The treatment consists of the mother ruling the child, instead of the opposite.

The mother, however, often being neurotic herself, it is essential to remove the child to another environment—one with quietness, country air, plain suitable food, and a woman of good understanding who will tactfully but firmly win over the child and instil obedience.

In one of the writer's cases, in a neurotic child of 51/2 years, whose mother had for months been trying to entice her to take food, he overcame the difficulty by telling the child that he was going to have "a great secret" with her; that she and he only would know it; that she was "to eat as much as she possibly could at every meal during the next week," when she was to come and see him again. The child, seemingly delighted at being trusted with a real secret, began to gain rapidly and, receiving no sympathy by refusing food, acquired the habit of eating. Another child, aged 1 year 5 months, was sent to a nursing home, where she was given food and plainly made to understand that she was expected to eat it immediately and without any fuss. A mixture of compound tincture of cinchona, 5 minims (0.3 c.c.); tincture of nux vomica, 1 minim (0.06 c.c.), and potassium bromide, 2 grains (0.12 Gm.), was given before meals. The parents were informed they would not see the child for a week. She became distinctly hungry, gained weight, slept well, and continued to improve when returned to her home.

> In the case of a girl of 9 years reported by T. W. Clarke (N. Y. State Jour. of Med., Mar. 14, 1924), a bad fright had been followed by increasing anorexia, emaciation, melancholia, and weakness so marked that she could not stand without support. Forced feeding through a stomach tube was resorted to. An opaque meal revealed an atonic stomach and a dilated, diseased appendix. Subsequently appendectomy was carried out, a very large, extremely hard appendix, with its lumen large enough to contain a lead pencil, being removed. Improvement began at once. and a year later the child was in normal health.

The writer regards diseased tonsils as a common cause of anorexia and recurring attacks of gastric disturbance. Tonsillectomy may put a stop to cyclic vomiting. Appendicitis should also be kept in mind, even with the abdomen apparently normal. The commonest cause of anorexia is irregular and improper feeding. A well balanced, attractive diet should be supplied and the child taught to eat all the food set before him. In case of a distinct aversion to a certain food, protein skin tests are advisable before insisting that it shall be eaten.

ANTHRAX. —Epidemics of anthrax have been prevalent of late among cattle in different sections of the United States, and carelessness in disposing of the bodies of the infected animals inevitably results in a certain number of cases in human beings. With increased precautions taken among workers in hides, W. B. Blanton (Va. Med. Mthly., Aug., 1924) deems infected shaving brushes the most fertile source of sporadic dissemination. When a recently purchased, cheap shaving brush is found in connection with a case of anthrax, the probability of its being the origin of the infection is great; confirmatory evidence would accrue from the demonstration of anthrax bacilli upon brushes in the same lot as the one used by the infected person. He estimates the yearly incidence of anthrax in this country at about 153 cases.

PROPHYLAXIS.—According to the investigations of H. F. Smyth and E. F. Pike (Amer. Jour. of Hyg., May, 1923), iodine is a reliable agent for the disinfection of hides, and may be used in the tanning industry without the least injury to the hides. There are 2 gen-

eral methods of application, viz., vapor disinfection and wet disinfection. In the latter process, the solvent used may be either water or a volatile fluid such as carbon tetrachloride or a mixture of the latter with gasoline.

For the sterilization of shaving brushes O. Thomsen and V. Jensen (Hospitalstid., Oct. 15, 1924) advise, since the brushes generally do not withstand hard boiling, a washing with soda followed by immersion in dilute formaldehyde solution, kept at a temperature of 40 to 50° C., and a final thorough rinsing in water. In the fatal case they report, a new shaving brush of Chinese horse hair had been used for 2 weeks; it was found to contain anthrax spores.

The investigations of Besredka in guineapigs have shown that anthrax infection occurs only through the skin, and that immunity also relates to the skin, as the animals can be completely immunized only by intradermal vaccination. H. Plotz (Ann. de l'Inst. Pasteur, Feb., 1924) verified this observation in rabbits, finding that large doses of anthrax germs injected under the skin failed to kill unless they come in contact with a laceration in the skin. The subcutaneous injections induced little or no immunity, whereas intradermal injections of attenuated virus induced pronounced immunity. Brocq-Rousseu and Urbain (Ibid., Mar., 1924) obtained similar results in horses, which they immunized quickly and durably with 2 intradermal injections of anthrax vaccine. According to Gratia (C. R. Soc. de biol., Oct. 7, 1924), the reason for the different effects in and beneath the skin is that upon intradermal injection the virus becomes encapsulated, multiplies and saturates the tissues with aggressins, against which the body reacts by the production of antiaggressins, acting powerfully as antibodies. Upon subcutaneous injection, on the other hand, phagocytosis soon destroys the virus, which has no chance to set free aggressins; the only response of the body consists in the production of agglutinins, which are less efficient as immune bodies.

TREATMENT.—The opinion appears to be steadily gaining ground that the most effectual treatment for anthrax consists in the administration of anti-anthrax serum in large dosage. According to H. E. Santee (Ann. of Surg., Sept., 1923), excision in anthrax is inadvisable because it may disseminate the infection in the tissues, while failing to remove it completely. The swelling in the tissues is due to a semigelatinous substance, anthracomucin, the purpose of which is to hinder the development of the anthrax bacilli, and which should consequently not be interfered with. The serum treatment should be intensive at the beginning, then gradually reduced after 48 hours or if blood culture proves negative. In 13 out of 16 cases treated at the Bellevue Hospital, 40 c.c. of serum were given intravenously and 10 c.c. locally every 4 hours, beginning with the first culture taken. All injections were preceded by a desensitizing dose. In 3 cases local injections of serum were alone given, 2 cases being given 10 c.c. every 4 hours for 5 days and the other, 10 c.c. daily for 3 days. Out of 4 septicemic cases, 3 died. The 12 other cases all recovered. The procedure finally decided upon is to consider all cases septicemia from the start and administer 1 or 2 massive doses of serum intravenously until the blood culture proves definitely negative. Serum reactions were observed in nearly all instances.

J. C. and C. Regan (Amer. Jour. Med. Sci., Feb., 1924) report 6 new cases successfully treated by general

as well as local serum therapy. Their present procedure is to inject a total of 6 to 12 c.c. of serum (prepared by the Eichhorn method) through a fine needle at 2 or 3 points about 1 cm. outside the eschar, in the indurated zone. In the usual case 4 to 6 such injections, given once, twice or, rarely, 3 times a day, suffice. In addition, serum is given intravenously, intramuscularly and subcutaneously in a dosage ranging from 40 c.c. every 12 to 24 hours in mild cases to 200 to 300 c.c. every 3 to 6 hours intravenously in septicemic cases. Some of the most grave types may have little constitutional disturbance. The size of the lesion and extent of edema offer some guidance for the 1st day's treatment. Massive dosage until the result of the blood culture is known is advisable. The writers' series now includes 16 cases, of which all recovered but 2, who had well-developed septicemia on admission. The anthrax wound heals quickly under serum treatment, with practically no scarring. In the 6 cases reported in detail the cultures from the lesion were positive in all but 1 case, in which incision had been carried out before admission. All cultures after the initial serum treatment were negative. Blood cultures, mentioned in 3 cases, were negative in 2 and merely suggestive in 1.

D. Symmers (Ann. of Surg., June, 1922), reporting a case of anthrax septicemia cured by large doses of serum, warns against surgical measures as well as against being deceived by an apparent state of well-being of the patient, which may continue even if the bacilli are swarming in the blood.

According to O. Grasser (Wien. klin. Woch., Mar. 13, 1924), a single

injection of 0.45 to 0.6 Gm. of neoarsphenamin may cure recent cases of anthrax. Chill, fever and sweating occur on the same day, after which the temperature declines. This decline may not occur for 3 or 4 days, however, in severe cases, in which event the treatment is repeated 2 or 3 times at 2-day intervals.

In a case of anthrax septicemia, seemingly moribund, referred to by E. Baumann (Klin. Woch., Dec. 9, 1922), in which the disease followed a kick on the hand by a cow, intravenous injection of 20 c.c. of a 1 per cent. solution of argochrome was followed in 4 hours by general improvement, with fall in temperature, and upon repetition 2 days later, resulted in recovery. Two other cases were likewise successfully treated with this agent, which is chemically methylene-blue silver. Methylene-blue acts selectively on the anthrax bacillus.

In contrast to prevailing views, L. Conti (Policlin., May 29, 1922) recommends a wide excision en masse of the pustule with the surrounding edematous tissues, followed by cauterization with 10 per cent. zinc chloride solution. Out of 60 cases, only 2 died, and the cosmetic end-results were satisfactory.

ANTIMONY.—Two new antimony compounds for intravenous use have been described by A. Randall (Amer. Jour. Med. Sci., Nov., 1924), viz., sodium antimony thioglycollate and the triamide of antimony thioglycollic acid. The following drawbacks of tartar emetic are stated to be overcome in these products: Questionable stability when heated for sterilization; production of alarming symptoms and an occasional death; bone aches, dyspnea, etc., as reactions which make some patients refuse treatment. The new drugs also showed lower toxicity and greater therapeutic value than tartar emetic. The first is a

white powder, very soluble in water, having the formula (CH2. S)2 SbCOO. COO-Na and containing 37.17 per cent. of antimony. It can be sterilized by boiling without chemical change other than the separation of a little antimony sulphide, which can be filtered off under sterile conditions. The second compound occurs in white, glistening plates, soluble 1:200 in water, having the formula Sb(S. CH2CONH2)3 and containing 30.77 per cent, of antimony. It is much more soluble in boiling water. and on sterilization behaves like the first compound. The precipitate of antimony sulphide on boiling should always be filtered off before injecting either drug. The dosage of the second drug (T. A. T.) advised is one 20 c.c. ampule of a 0.4 per cent. solution. The first drug (S. A. T.) is used in a 20 c.c. ampule of a 0.5 per cent. solution or 10 c.c. of a 1 per cent. solution. In 7 cases of granuloma inguinale daily intravenous injections were given with excellent therapeutic results and no general, local or vascular irritation. There is some evidence of the feasibility of injecting these drugs likewise subcutaneously or intramuscularly.

ANURIA. -In a case of acute nephritis with anuria of 6 days' standing following an infected finger contusion in a boy of 11 years, C. A. Bowers and H. R. Trattner (Surg., Gyn. and Obst., Aug., 1924) first performed a decapsulation of the right kidney, which produced no immediate benefit, then resorted to a new method, viz., repeated venesection transfusions, the patient being bled 500 c.c., then at once transfused with an equal amount of blood from a healthy donor. Four such treatments were given at intervals of 2, 4 and 3 days, with resulting definite and marked relief of the uremic symptoms and ultimate recovery. The writers believe this procedure useful to tide such patients over a critical period, though it should not supplant renal decapsulation.

According to R. Grünbaum (Wien. klin. Woch., Oct. 25, 1923), diathermy was effective in a case of reflex anuria of 20 hours' duration in a man of 54 years, with pain and slight sensitiveness in the left lumbar region. A condition of spasm of the smaller renal vessels being suspected, a large electrode was applied over the abdomen and a smaller one over the left kidney and a current of 1500 ma. used for ½ hour; 2½ hours later urine containing much gravel was passed and by the following day the emunctories had been restored to normal.

### AORTITIS.—DIAGNOSIS.—

Among the symptoms of syphilitic aortitis, which occurs mainly in subjects 40 to 60 years of age, E. J. Stolkind (Wratsch, Oct., 1923) lays most stress on dyspnea, retrosternal pain and susceptibility to fatigue. The dyspnea may occur upon exertion or in paroxysmal attacks, by day or night, assuming the form of cardiac asthma. Postmortem, he often failed to find changes in the aortic wall, coronaries or heartmuscle to account for the anginal pain, which he is therefore led to ascribe to toxic irritation, frequently dependent on digestive disturbances and subject to relief by a diet of milk and vegetable foods. Dulness may be detected on light percussion, and a systolic murmur is frequently audible over the vessel, together with an accentuated 2d sound. There is fever unless added infection exists. X-ray examination is likely to reveal some change in the aorta, while the Wassermann, if positive, is very helpful. G. Hubert (Klin. Woch., May 13, 1924) describes the substernal pain as mild at first, then of a burning type, intermittent, and often regularly awakening the patient at night. The pain may radiate

to the left shoulder and arm, even though the coronaries are uninvolved. The systolic murmur is best heard in the 2d or 3d right interspace and may vary in intensity in different postures. The differential features revealed by the X-ray comprise a convexity of the ascending aorta or diffuse dilatation; unusual depth of the aortic shadow, and abnormal pulsation of the vessel. The period of survival after symptoms is typically 3 to 5 years, but may be considerably longer. Under treatment many cases are afforded lasting relief from their symptoms.

Leconte (Médecine, Mar., 1924) states that aortitis may cause such general symptoms as headache, loss of weight, fainting spells and abdominal manifestations, e.g., distention, nausea and diarrhea. The oppressive nature of the pain, its onset upon exertion and the arm numbness or pain sometimes coexisting are of assistance in distinguishing the condition from digestive dis-Sometimes the pain may orders. be situated solely in the arms, hands or chin, or be replaced by palpitations or brief tachycardial seizures. X-ray study shows a broadening or unusual opacity of the aorta. According to E. Bordet (Ibid., Mar., 1923), the latter change may be detected even before symptoms set in.

A paravertebral zone of dulness extending to the left 2 or 3 finger-breadths from the spines of the 3d to the 6th dorsal vertebræ is described by Hitzenberger and Elias (Wien. Arch. f. inn. Med., Dec., 1923) as an evidence of dilatation of the thoracic aorta.

Libensky (Casop. lek. cesk., Nov. 24, 1923) noticed a discrepancy be-

tween the carotid pulsations and heart-beats in a number of cases with aortitis. The former were pronounced, while the cardiac contractions were normal or feeble. At times 1 carotid, particularly the left, showed pulsations much more marked than the other. In many instances dilated superficial veins in the aortic region were observed.

Gastric disturbances resulting reflexly from an obscure aortitis are emphasized by C. Monge (An. de la Fac. de Med., Lima, vi, 1, 1923). They may consist either of atony and reduced secretion, or of increased secretion and other apparent manifestations of gastric ulcer. The treatment for syphilitic aortitis causes them to disappear.

In a case reported by Chabrol and Blum (Bull. Soc. méd. des hôp. de Paris, Feb. 2, 1923) hemorrhage from the bowel and per orem had been present for 1½ years and operation for ulcer advised but refused. At necropsy a dilated, atheromatous aorta was found with a fissure in its wall opposite another small fissure in the bifurcation of the trachea.

PROGNOSIS.—Observing 140 cases of syphilitic disease of the aorta for periods of 1 to 8 years, F. A. Willius and A. R. Barnes (Minn. Med., Apr., 1924) divided them into 3 groups, viz., early, moderately advanced, and advanced, comprising 10, 30 and 100 cases, respectively. In the 1st group the average time from the primary lesion to the first examination was 17 years. Five had mild dyspnea and palpitation on exertion, 3 no cardiovascular symptoms, and 2 typical anginal attacks. A peculiar tympanitic accentuation of the 2d aortic tone, with other evidence of syphilis, warrants a diagnosis of early syphilitic aortitis. Of 5 cases traced, 3 were worse, 1 improved and 1 unchanged.

The 2d group had rough, reverberant, systolic aortic murmurs, frequently transmitted to the carotids. Thirteen had dyspnea and palpitation; 11, angina pectoris, and 6, no cardiovascular symptoms. Many showed cardiac enlargement under the X-ray, but only 3, aortic dilatation. Of 18 cases traced, 6 were unchanged, 4 worse, 2 improved, 2 dead of heart disease, and 4 dead of other causes.

The 3d group comprised the cases in which aortitis had progressed to the point of aortic regurgitation. All had cardiovascular symptoms. The X-ray showed aortic dilatation in 18, including aneurism in 6. Of 64 cases traced, 31 were dead of heart disease, 13 worse, 13 unchanged and 6 improved.

TREATMENT.—No contributions to the treatment of aortitis have been made of late other than in relation to the syphilitic form. hopeful note is sounded by Schottmüller (Deut. med. Woch., Feb. 9, 1923), who reports cases of definite improvement, such as reduction in size of an aneurism or marked benefit in syphilis of the coronaries, from vigorous antisyphilitic continued Weekly injections of treatment. 0.45 to 0.6 Gm. of neoarsphenamin are first given up to a total of 5 to 8 Gm., together with weekly injections of 0.05 to 0.1 Gm. ( $\frac{3}{4}$  to  $1\frac{1}{2}$ grains) of calomel or mercury salicylate. Thereafter potassium iodide is ordered for 1 or 2 months. Subsequent treatment usually consists of a monthly injection of neoarsphenamin for 2 or 3 years, particularly

where the Wassermann is positive, or of 2 courses of intensive treatment, to a yearly total of 5 Gm. of the arsenical drug.

L. Potheau (Intern. Clin., June, 1924), in syphilitic aortitis, first gives 4 daily intravenous injections of 0.01 Gm. (1/6 grain) of mercury cyanide; then, after 1 day's rest, an intravenous injection of 0.05 to 0.15 Gm. of neoarsphenamin. In subsequent weeks, these procedures are repeated, with the dose of the arsenical increased, however, to 0.1 to 0.3 Gm. in the 2d week, then 0.15 to 0.45 Gm., 0.2 to 0.45 Gm., and 0.25 to 0.45 Gm. Repeated courses of this description are given, at intervals not exceeding 2 or 3 weeks. When the aortic condition has improved, the ordinary treatment for general syphilis is followed. Potassium iodide, 2 Gm. (30 grains) a day by the mouth, or oily iodine preparations intramuscularly, are employed only if the preceding measures are ineffective. Caution in the treatment is required if there is cardiac impairment.

In 301 cases, G. Wodtke (Arch. f. klin. Med., July, 1924) found improvement or arrest of the aortitis in 79.3 per cent. of the cases that had received arsphenamin with mercury or iodine, in 61.6 per cent. of cases receiving iodine with mercury or bismuth, in 14.7 per cent. of cases inadequately treated, and in 3.6 per cent. of cases untreated. Doses up to 0.45 to 0.65 Gm. of the arsenical were used, to a total of 4 to 6 Gm.

Schottmüller's plan of treatment [described above] is endorsed by the writer.

Early diagnosis and treatment are emphasized as promoting best results, although even in advanced cases the X-rays showed regression of the aortic disease during the treatment.

APHASIA.—In 2 cases of metastatic tumor nodules in the left hemisphere, P. Bailey (Arch. of Neurol. and Psych., May, 1924) was enabled to determine the exact position of these nodules by reference to the schema drawn up by Pierre Marie and Foix on the basis of war experience to show the various forms of involvement of the speech area in this hemisphere. These observers, departing from the earlier view of a restricted speech center (Broca's) in the 3d left frontal convolution, recognize the following 5 zones:

- (1) Zone of anarthria (quadrilateral lenticular zone), disease or injury of which is manifested in: Dysarthria involving simultaneously intonation, articulation and rapidity of elocution. On attempting to speak, pronounced effort, premonitory hesitation and spasmodicity of speed. Aphasia slight, consisting mainly of difficulty in reading, sometimes in writing and figuring.
- (2) Zone of the supramarginal gyrus: Aphasia involving all the elements of speech (global). Hemianesthesia nearly always present, slight brachial monoplegia usually, and bilateral ideomotor apraxia sometimes. No hemianopsia.
- (3) Zone of the angular gyrus: Alexia predominant and almost absolute. Writing relatively unaffected. Speech comprehension and calculation impaired. No anarthria. Hemianopsia always present, sometimes as a quadrant defect.
- (4) Temporal zone: Aphasia affecting especially the naming of objects (loss of vocabulary). Comprehension of speech, reading, writing and calculation equally involved. Intelligence reduced. Anarthria practically absent. No hemiplegia. Hemianopsia present, often in quadrant form.
- (5) Zone of global aphasia (involving chiefly the posterior central gyrus and partly the supramarginal and superior temporal gyri): General aphasia. Pronounced reduction of general intelligence. Speech reduced to a few words, with comprehension only of the simplest orders.

Reading, writing and calculation practically impossible. No apraxia. No hemianopsia.

In a case of motor aphasia reported by Fiamberti and Filippini (Rif. med., Apr. 30, 1923), the condition set in immediately after a stab wound at the foot of the 3d left frontal convolution. Facial paralysis and other manifestations of hematoma appeared after 3 days, and were relieved by **decompression**. The aphasia retrogressed slowly after some months.

TREATMENT.—A mode of procedure yielding rapid results in the reëducation of aphasics is described by C. G. Stivers (Jour. Amer. Med. Assoc., Oct. 20, 1923). His case was that of a man aged 36 who had been struck on the left side of the head by an aeroplane propeller, with resulting destruction of a segment of skull extending from the midline of the head toward the ear and maceration of the brain cortex. Upon suitable surgical treatment, consciousness began to return, though with complete aphasia, at the end of a week, and the initial right-sided hemiplegia partly retrogressed. Later, scar tissue was dissected out on account of epileptic seizures, and an inlay bone graft from the tibia successfully implanted. The subsequent occasional epileptic seizures were controlled by a daily dose of 5 grains (0.3 Gm.) of phenobarbital.

The patient was told to think of himself as learning to speak and express himself all over again and to note his constant improvement. His wife's aid was enlisted to help him practice, read to him and cheer him. Deep breathing, auditory practice, importance of the vowels, inflection and use of all necessary face muscles was emphasized. Speech reëducation began with diaphragm breathing and counting, together with explanation of his difficulty in making the wide "e" and "eh" sounds.

After a week's training in counting, he could count perfectly. Sums in addition and subtraction followed, with vowel practice combined with consonants, and singing the vowel sounds up and down the scale. Consonants difficult to pronounce were thoroughly practised with special words embodying them. Then followed rhymes and poems, measurements, money, writing with both hands, etc. The patient was thus greatly improved, being enabled to copy words, read words, say words and sentences, and express all things intelligibly, if unhurried. The voice gained in volume, and the patient was much more cheerful and had a more hopeful outlook.

APPENDICITIS, ACUTE.— **SYMPTOMS.**—The variability of the pain in appendicitis is emphasized by I. S. Ravdin (Internat. Clin., June, 1924). While the most constant symptom, it is never an absolute indication of the extent of the disease. Excessive pain may be due to kinking of the appendix with complete blocking off of a portion of its lumen. Its severity also varies according to whether the patient is hyper- or hyposensitive. Peritoneal pain sometimes overshadows the pain in the right iliac fossa caused by tension in the appendix. In rapidly progressive cases bacteria pass through the appendiceal wall in the absence of any macroscopic perforation. Even greater variations occur in the leukocyte count than in the pain.

Instances of acute appendicitis with pain in the bladder as the predominating symptom are given by R. J. Groom and W. W. Reed (Colo. Med., Feb., 1924). In 1 case the pain gradually increased while the urinary flow diminished; a large abscess was found in the pelvis between the bladder and rectum, with the bladder wall ulcerated and the gangrenous tip of the appendix in the

center of the abscess. In such cases there is generally a history of an earlier attack, during which the appendix became adherent in the bladder region.

> Hyperesthesia of varying degree was noted by B. Szerszynski (Polska gaz. lek., Oct. 15, 1922) in 22 out of 80 cases of acute appendicitis. It began with the other symptoms and passed off gradually as they receded. Continued hyperesthesia was observed to accompany a relatively mild and short course of the disease, permitting of early interval operation, with uniform absence of severe changes in the appendix. The presence of hyperesthesia in the acute state appears to portend abscess rather than perforation. Hypesthesia, on the other hand, was found in 38 cases, increasing in intensity with the progress of the disease and being frequently present after the acute stage in protracted cases. In 15 cases with hypesthesia operation revealed infiltration in 7, perityphlitic abscess in 5, and perforation with adhesions in 3.

Regarding the symptoms of acute appendicitis in children under 5 years of age, J. Howland (Jour. Amer. Med. Assoc., Sept. 27, 1924) points out the following diagnostically serviceable features: The appendix being relatively long in children, when there is peritonitis, even if localized, the pain may be low down in the pelvis, high up in the abdomen or in the back, or even on the left side. In a child too young to localize the pain or make verbal complaint of it, it may be inferred from constant crying and restlessness, and from the fact that he sleeps badly. (Children with pneumonia or other fevers usually sleep for long stretches). The pain is nearly constant, but with localized suppuration may be increased by defecation or urination.

Absence of pain on sitting up argues against appendicitis. The child may limp. Fever is often not above 101° F. Its height bears no relation to the severity of the lesion. The same is true of the leukocytosis, which is generally below 20,000. Vomiting at the start is seldom absent, and may continue throughout. Constipation is more frequent than diarrhea. Tenderness is rarely wanting, and usually extreme, though in appendicitis due to intestinal parasites it may be insignificant. As there is a great tendency for the abscesses to gravitate downward and to extend over to the left side, the tenderness may be widely distributed and in unexpected situations, even in the absence of general peritonitis. trying to elicit reflex rigidity, light pressure should be used, deep pressure being reserved to examine for tumor, which often requires a general anesthetic. Rectal examination should never be omitted. In the 7 cases of appendicitis in children below 2 years of age seen by the writer, the course of the disease was not rapid. Six recovered after operation. Upon operation before general peritonitis or pocketing of pus in numerous places, the mortality in children should be even less than in

DIAGNOSIS.—To distinguish appendicitis from adnexitis, Sattler (Deut. Zeit. f. Chir., Oct., 1924) adopts the following procedure: The patient, sitting erect in bed, is required to raise her extended right leg, with some assistance from the observer. To keep the trunk upright, an assistant meanwhile makes pressure against the back. In appendicitis this results in sharp pain at

the junction of the middle and right thirds of a line joining the spines of the ilia, the cecum being compressed between the psoas muscle and abdominal parietes. In adnexitis, the pain produced is somewhat lower and more to the right. The test was uniformly useful in 150 cases.

In the differentiation from early pneumonia, R. St. L. Brockman (Pract., Aug., 1924) regards spasm of the external oblique in its uppermost fibers as indicating chest involvement, whereas spasm of the lower fibers suggests appendicitis. A temperature of 102° F. or over is strong evidence against appendicitis in the first 24 hours. Anything resembling a chill favors chest infection, as does also a full, bounding pulse or a leukocytosis of 25,000 or The abdominal respiratory movements are more impaired by peritoneal infection than by pleuropulmonary irritation. In pneumonia blood cultures are positive early.

The symptoms of appendicitis may resemble those of ureteral calculus, as emphasized by T. H. Sweetser (Jour .-Lancet, Apr. 1, 1924). Where the appendix is directed inward and upward behind the mesentery it may approach the genitofemoral nerve, with resulting referred pain in the testicle or vulva and thigh, and possibly retraction of the testis. Hematuria or pyuria may occur where the appendix is close to the ureter; on the other hand, in ureteral calculus the urine may be normal. A distinguishing feature is that right rectus rigidity is fairly rare in the ureteral disorder. In uncomplicated ureteral cases fever and leukocytosis are ab-In doubtful cases, X-ray study of the abdomen and pelvis to

exclude calculus is generally permissible. Suspicious shadows are to be confirmed by cystoscopy and ureteral catheterization. The risk attending protracted delay of operation in appendicitis should be kept in mind.

In a series of cases received for operation for appendicitis, E. König (Med. Klin., May 11, 1924) found the diagnosis incorrect in 18 per cent. of acute cases and in 35 per cent. of chronic cases. Pain on both sides indicates salpingitis rather than appendicitis. When headache is complained of, typhoid fever should be remembered. In gall-bladder disease, the pain is arrested by blocking of the 10th right dorsal nerve. Diffuse pain with vomiting and other evidences of perforative peritonitis may result in young individuals from a form of serous peritonitis of obscure, possibly influenzal, origin. Unnecessary operations have been done for bowel spasm and umbilical colic in nervous children, in spite of the absence of fever.

Acute seminal resiculitis as a condition that may simulate acute appendicitis is emphasized by U. G. Dailey and W. S. Grant (Med. Jour. and Rec., June 18, 1924), who report 3 cases in which this source of confusion was encountered. In 1 of these, with rigidity of the lower half of the right rectus, appendicitis was deemed probable until a rectal examination was made, revealing a tender, distended right vesicle and tender, palpable vas deferens. Vomiting was absent in all 3 cases, though nausea was present, and the tenderness was somewhat below McBurney's point. The value of rectal examination in atypical or dubious cases of suspected appendicitis is stressed.

According to L. B. West (Intern. Jour. of Med. and Surg., Sept., 1924), appendicular pain coinciding with menstruation is of service in the diagnosis of appendicitis. Palpation of the right iliac fossa at various times in the menstrual cycle will sometimes reveal appendicular tenderness and appendectomy in this type of case often relieves the menstrual disturbance. Appendicitis frequently simulates dysmenorrhea; the distinction is made by the history, appendicitis having generally been preceded by digestive disturbances and right lower quadrant discomfort, whereas the dysmenorrhea may occur in conjunction with a vaginal discharge and be followed by acute pelvic inflammation.

The conditions requiring differentiation from acute appendicitis in small children are listed by H. F. Helmholtz (Minn. Med., Mar., 1924) thus: Respiratory infections, typhoid, prodromes of acute infections, osteomyelitis of the femur or ilium, pericarditis, cyclic vomiting, gastrointestinal colic, mesenteric lymphadenitis or cysts, and intussusception of Meckel's diverticulum. The extreme importance of early diagnosis is urged, in view of the insidious course of the disease. 15 cases under 5 years, only 4 were referred to the surgeon within 48 hours, and 9 already had generalized peritonitis. Usually the previous attack, if any had occurred, consisted of indefinite abdominal pain with vomiting and slight, transient indigestion. Diarrhea lasting 12 hours, without pain or vomiting, may be reported as the only evidence of previous attacks.

In the major attack, vomiting that continues after evacuation of the stomach and persistent pain are diagnostically significant. Flexion of the right thigh, of sudden onset, or deflection of the trunk toward the affected side, are suggestive. Local tenderness is the most significant Rigidity may be absent. finding. While the leukocytes are usually increased to 15,000 to 20,000, a count of 8000, with 85 to 90 per cent. of polymorphonuclears, suggests appendicitis, especially if eosinophiles are absent. Mesenteric cyst in the lower right quadrant may produce the symptoms of appendicitis. A mass in this quadrant is generally an appendiceal abscess, although it may be omentum folded about an inflamed appendix.

Following is a summary of data from F. Beekman's (Ann. of Surg., Apr., 1924) analysis of 145 operated acute cases in children:

	Non- PERFORATING CASES.	SPREADING PERITONITIS.	ABSCESS CASES.
Total number	48	44	53
Mean temperature	101.3° 113	102.1° 127	101.5° 116
Mean pulse rate	25	32	32
Pulse-respiration ratio	4.5	4	4.1
Vomiting (per cent,) Abdominal tenderness not gen-	85	97.7	83
eral (per cent.)	87.5	22-7	83
Abdominal mass (per cent.)	0	4.5	34
Mortality	0	18.2	83 34 5.7

ETIOLOGY.—Whereas the finding of septic appendicitis directly preceded by tonsillitis or an exanthema is not unusual in children, in adults this is rare. J. O. Bower (Med. Jour. and Rec., Jan. 21, 1925) reports the case of a man aged 37 who developed appendicitis during the height of an attack of streptococcic tonsillitis. Abdominal pain and sore throat had developed 30 hours before his admission to the hospital. The temperature was 103° and leukocyte count 21,800. A perforated

gangrenous appendix with general suppurative peritonitis was found; recovery followed. Blood culture was negative, but the culture from the appendix showed streptococci, coliform bacilli and diplococci. The route of infection in such cases is usually the blood-stream.

Appendicitis accompanying or following influenza has been not uncommon, and Behrend has reported 8 such cases, who had been in bed 4 days before the appendix symptoms developed; he operated on 3 cases. Appendicitis should be suspected in intestinal influenza upon the appearance of persistent lower abdominal pain with tenesmus; localized tenderness; dullness in the flanks, and increasing leukocytosis.

As noted by C. H. Mayo (Jour. Amer. Med. Assoc., Aug. 23, 1924), the appendix may be involved in pelvic inflammation and its resistance lowered. The work of Rosenow on the reproduction of appendicitis by bacteria taken from diseased appendixes shows that appendicitis is not caused by the colon bacilli, but usually by streptococci of much the same type as inhabit the crypts of tonsils and the apical abscesses of The inflammatory exudate becomes infected, secondarily, by the colon bacilli in cases of perforating abscessed appendix.

Out of 470 operated cases of appendicitis, J. Berger (Presse méd., May 3, 1924) found foreign bodies other than fecal material or parasites in the organ in 6 instances. These foreign bodies comprised pieces of calculi, a piece of lead, shot, grapeseeds, a splinter and a toothbrush bristle. Definitely proven cases of appendicitis caused by a foreign body

have been few, but many appendixes are not carefully examined and a foreign body may have left the organ after starting the trouble. The worst cases of appendicitis due to a foreign body are those in which the mucous membrane has been injured by it, e.g., by a nail or fishbone.

Bülmann (Ugeskr. f. Laeger, Dec. 27, 1923) notes that the bristles on pig's skin are rather hard to remove thoroughly, especially in the skin folds, and he found such bristles in the appendix in 2 cases operated on for acute appendicitis, in 1 instance enclosed in a coprolith. G. Clausen (Ibid., Feb. 14, 1924) reports the case of a man who had eaten some pork, including the rind, on the day previous to the onset of acute appendicitis. A thick bristle was found projecting for 34 centimeter (3/10 inch) outside of the wall of the appendix, which showed no evidence of disease prior to that induced by the foreign body. A little pus was observed in the peritoneal cavity.

According to A. Armstrong (Atlantic Med. Jour., Apr., 1923), appendicitis is often tuberculous; while it may be primary, it is usually secondary to a focus in the lungs. Of 200 cases in private sanatoriums, 12.5 per cent. had had appendectomies; in a public sanatorium, 6 per cent. Appendicitis is often followed by ill health culminating in active lung disease. A careful history and physical examination, with X-rays if possible, should be made of all patients to be operated on, to discover any active or latent lesion. should not be used in such cases, and convalescence should be prolonged to avoid subsequent activation of any lung lesion.

**PATHOLOGY.**—That severe acute pathologic lesions of the ap-

pendix may remain quite latent until the inflammation reaches the peritoneum is emphasized by R. Bonneau (Monde méd., July 1, 1924), who relates the following case: A few moments before beginning a hysterectomy for fibroid tumor he reexamined the patient, finding her temperature normal (37° C.), pulse 70, no pain nor muscular tenseness; palpation and bimanual examination revealing nothing other than an ordinary uterine fibroid. After the hysterectomy, a prophylactic appendectomy was done. Upon examination the appendix showed necrosis of almost the entire mucosa and a portion of the muscular layer. dently, the pathologic changes in acute appendicitis may precede the symptoms, and the operator, in noting the time of operation after onset, can specify only that he intervened, e.g., at the 6th, 10th or 24th hour after the apparent onset of the appendicitis.

COMPLICATIONS .- The importance of chills as a symptom of thrombosis, especially of veins, in appendicitis is urged by W. Thalhimer (Arch. of Surg., Mar., 1924). Pylephlebitis as a complication generally appears several days to several weeks after the onset of appendicitis, at which time it is usually fatal. Sometimes, however, it is present earlier, as shown by chills and the finding of thrombi in the veins of the mesoappendix and in other veins at the operation for appendectomy, at which time the condition is curable, the veins being ligated above the thrombus, with or without excision, or the vein incised and emptied of its thrombus.

Prophylaxis of this serious complication consists in operating at

once in all appendix cases with a history of 1 or more chills. The appendix and ileocecal structures should be handled gently at operation; the mesentery cut as close to the base of the appendix as possible, slowly in order to make sure that the vessels bleed and are patent, and the veins of the ileocecal junction and caput coli and the ileocolic vein itself carefully examined. In 3 cases with chills and thrombi the procedure described was followed by recovery, while in a 4th case in which a secondary operation because of thrombi found in the specimen was recommended but refused, further chills, a typical pylephlebitis and death followed.

TREATMENT.—Statements have been made of late that the mortality rate from appendicitis is now greater than it was in 1910. According to C. H. Mayo (Jour. Amer. Med. Assoc., Aug. 23, 1924), this is due to the fact that the younger generation of practitioners, who did not benefit by the early period of discussion of appendicitis which continued for a number of years after Fitz's original paper in 1886, have not recognized the seriousness of appendix infections, and therefore have not made haste to diagnose and operate early in these cases. Too many operations are performed during the dangerous intermediate period between early and late infection, and possibly too much is attempted in the late operation when there is an abscess. R. C. Dugan (Jour. Kans. Med. Soc., Jan., 1924) warns that the giving of purgatives before and after operation increases the mortality. He favors immediate operation in all cases if conditions are proper, except for a small minority of cases that are not seen by the surgeon until the 3d to the 8th day and are judged inoperable because of extremely bad condition, extension of peritonitis to the diaphragm, etc., in which cases he favors Ochsner's starvation treatment. The latter cannot be given satisfactorily, however, without a trained nurse, and should be given in a hospital if possible, requiring careful observance of minute detail if it is not to prove harmful.

J. W. Kennedy (Amer. Jour. of Surg., May, 1924) maintains that there is no treatment of appendicitis other than immediate operation, irrespective of the stage, and condemns not only cathartics but also the ice-bag, chiefly on the ground that, by relieving pain, it keeps the patient from the surgeon until a late hour. Bastianelli (Policlin., Oct. 15, 1922) likewise favors operation in any suspected case, regardless of the stage, and also advocates early interval operations—between 7 and 12 days after the acute attack.

On the other hand, R. J. McN. Love (Brit. Jour. of Surg., Oct., 1924) states that in the 1677 cases in which immediate operation was performed out of a total series of 2018, the mortality was 5.8 per cent., whereas in 341 cases treated on delayed lines it was but 3.5 per cent. His data indicate that when cutaneous hyperesthesia has disappeared, delayed treatment will usually allow the infection to subside. Incidental complications in cases operated on immediately proved about 3 times as common as in delayed cases. The delayed treatment, however, can be applied satisfactorily only under hospital conditions; constant observations must be made regarding alteration of local signs and changes in the general condition. The mortality of operated cases is notoriously high from the 3d to the 5th days, and especially at this period should delayed treatment be given a trial. At the 2 extremes of life delayed treatment is less successful, in children partly because purgatives are freely given, and in both instances because resistance to infection is low. In 221 cases operated within 24 hours after onset the mortality was 0.9 per cent.

Preoperative vaccine treatment in acute or chronic appendicitis is advocated by De Nabias (Bull. Soc. nat. de chir., June 28, 1924) in cases in which an intradermal test shows sensitiveness to colon bacilli. The vaccine employed consists of a suspension of colon bacilli killed by heat or of an extract of the same Positive responses range germs. from a bright red area several centimeters across to more extensive bluish patches. After such responses vaccination is carried out until the test becomes negative. The special object of the vaccination is to obviate the severe after-results sometimes following even a simple appendectomy on account of lowered resistance of the patient to the colon bacillus.

E. Bressot (Paris méd., Apr. 12, 1924), whenever the operation is performed over 48 hours after the onset, gives concurrently with the operation 2 to 6 injections of Delbet's stock vaccine. In cases operated within 48 hours, 1 vaccine injection is given if the appendix is found distended with pus. In the late cases the vaccine permits of omitting or limiting drainage and tends to attenuate abscesses of the abdominal wall.

Of 30 replies received to a questionnaire addressed to Pennsylvania surgeons by A. F. Hardt (Atlantic Med. Jour., Apr., 1924) regarding the treatment of peritonitis following ruptured appendix, 12 approved of the Ochsner treatment while 9 of the other 18 opposed to its general use reserved it for cases practically moribund when first seen. writer himself reserves it for cases with rapid pulse, extreme distention and cyanosis, of which a few may thus be saved by temporizing; when such cases show subsidence and localization, however, with slower pulse and general improvement, he operates. In general peritonitis gas-oxygen, local anesthesia or both should be used instead of ether. The operation should be rapid and no attempt made to remove an appendix that is not readily accessible. gauze is placed in the drainage tube it should be removed early, usually in 24 hours. Mikulicz drains are often helpful to keep the wound

APPENDECTOMY.—In regard to the incision in appendectomy, C. H. Mayo (loc. cit.), in children, favors the McBurney incision; in adults, a considerable percentage of such incisions are followed in 1 to 2 years by inguinal hernia because of muscular relaxation at the internal ring, probably due to injury of a nerve. In adults, he greatly prefers a straight right median rectus incision, as it permits exploration and is readily enlarged, whereas with McBurney's incision the real cause of disease in the gall-bladder, pancreas, stomach or duodenum, and occasionally in the pelvis, may be overlooked.

In an improved incision described by E. H. Wood (Can. Med. Assoc. Jour., June, 1924), the skin is divided for a distance of 3 to 4 inches in the line of the fibers of the external oblique muscle ¾ to 1 inch within the right anterior superior spine.

The middle of the incision is 1 inch below this spine. The customary muscle-splitting is then carried out, but when the peritoneum is reached it is stripped from the iliac fossa for about 2 inches, i.e., to within 1 inch or less of its reflection onto the cecum. With its fat, it is next taken up with forceps at this point and gently drawn up to the bottom of the muscle incision, and is then incised as close to the appendix as possible, whereupon the appendectomy can be done without exposing any intestine beyond the cecum. In abscessed cases a direct opening into the abscess cavity is afforded. This incision is suitable only where exploration is not required, as the field exposed by it is very small, but it is advantageous in avoiding adhesions interfering with the cecum, in greatly reducing the chances of hernia, and in obviating contamination of further tissues and postoperative hemorrhage. Gravity drainage from the pericecal region is provided.

For anatomical reasons, A. E. Rockey (Ann. of Surg., May, 1924) favors a transverse incision to the deep fascia, passing through McBurney's point and with its outer end just above the iliac spine and its inner end over the belly of the rectus. The only parts then cut are the rectus sheath, the aponeurotic junction at its outer border, and the muscle aponeuroses. An up-and-down pull is then applied, widely separating the muscles, whereupon retractors are used at the ends of the incision. In suturing, key sutures of No. 2 chromic gut are passed 5 mm. apart through the aponeuroses at the outer border of the rectus. With the patient on his side, dependent drainage through the outer end of the incision is obtained.

In cases with a definite mass in the right groin, J. R. Eastman (Jour. Ind. State Med. Assoc., Jan., 1923) advises caution in the incision down to the peritoneum. If the latter proves intact and movable over the underlying mass, peeling the peritoneum from the muscular parietes and seeking a low point of puncture are advantageous. With the finger, the operator next determines whether a true abscess exists or the mass consists merely of an enlarged appendix, wrapped in omentum and exudate. If no well-defined fluctuating abscess is palpable through the intact

peritoneum, the abdominal cavity should be entered and the appendix removed. If, on the other hand, an abscess is felt, it may be punctured low with the gloved finger and safely drained through the space between the peritoneum and musculature. If the low puncture cannot be made without considerable risk of general peritoneal contamination, a gauze tampon and drainage tube introduced deeply alongside or under the abscess will induce spontaneous rupture with safe drainage in practically every case. In cases with difficulty in determining whether abscess exists, ample seropurulent drainage has been attended by prompt disappearance of the mass and complete recovery. Opening of a large abscess to search for the appendix in late acute or subacute cases is hardly wise in view of the relief given by the suction drain in these doubtful cases.

Cutting of the ilcocecal fold as a routine step in appendectomy is advocated by G. F. Chandler (Amer. Jour. of Obst. and Gyn., Feb., 1924). Noting from statistics of other operators and his own that 15 to 25 per cent. of appendectomized cases complain of no benefit from the operation, he concluded that the triangular ileocecal fold, occupying 1 inch or more along the termination of the ileum and extending to the cecum, hindered the ileum from protruding sufficiently in the cecum for closure of the ileocecal valve. To obviate this, he places 2 hemostats on the ileocecal fold from the middle of its free margin to the junction of the ileum and cecum, cuts between them and ties off the 2 free segments resulting. Since he has adopted this practice no patient has returned without benefit from the operation.

E. Bressot (Paris méd., Apr. 12, 1924) has given up the thermocautery for section of the base of the appendix; he crushes with Doyen's forceps and applies tincture of iodine. The stump is buried if this is easily accomplished and the cecal wall is sound, otherwise not. Before closure of the peritoneum the region is cleansed with a pad freely moistened with ether. He deems it useless to leave over 30 to 40 Gm. of ether in the abdomen. Regarding drainage, his procedures are these: (1) Operation within 24 hours after onset: Complete closure after removal of the appendix

dix, even if turgescent and distended with pus. (2) Operation after 48 hours, in the presence of slight peritoneal reaction, edema of the meso, but no pus: Complete closure after removal of the appendix, whatever be its condition. (3) Walled-off abscess operated after 48 hours: (a) Appendix removed; drying with ether: Small drain in the lower end of the wound, removed after 3 or 4 days. (b) Appendix not removed: Drain in the lower end. (4) Diffuse peritonitis: (a) Appendix removed: Drain in the lower end. (b) Appendix not removed: Large drain in Douglas' cul-de-

J. J. Buchanan (Atlantic Med. Jour., Apr., 1924) departs from the customary procedure in operations for appendix peritonitis in that he closes the wound without drainage. The ruptured appendix is regularly removed. The incision is made large enough to permit dry mopping of the pelvis, thus removing several ounces or even a pint or 2 of pus; this, he finds, causes practically no irritation. Drains do not drain more than 24 hours and leave an entrance for new germs from the exterior. A case operated for diffuse peritonitis within 48 hours after the onset of pain and closed without drainage will in all probability get well. A local abscess, on the other hand, must always be drained, as the peritoneum has been destroyed and the remaining surface will continue to form pus.

Pre- and Postoperative Treatment.-In severely ill patients W. D. Gatch and D. C. Durman (Ann. of Surg., June, 1924) recommend preoperative intravenous injection of 800 to 1000 c.c. of normal saline solution, which greatly increases the safety of the operation. On operating, these observers avoid the use of gauze packs to wall off the appendiceal region, on the ground that these packs are traumatizing and extend the peritoneal infection. Postoperatively, they proceed as follows: Plenty of fluid intravenously, if water cannot be taken by the mouth; sufficient morphine; starvation until peritonitis has subsided; avoidance of cathartics; gastric lavage freely; frequent examination for secondary abscesses and prompt drainage, if such develop. Their mortality in 262 cases was 7.2 per cent.

After operation for peritonitis following ruptured appendix, Hardt (loc. cit.) em-

ploys the following measures: Sitting position, continuous hypodermoclysis and proctoclysis, enough morphine to relieve pain and induce sleep; hot packs to the abdomen; appropriate stimulation, preferably by camphor and digitalis, lavage when indicated, and blood transfusion where there is extreme depression.

## APPENDICITIS, CHRONIC.—

This subject is still in a somewhat confused state. H. W. Bettmann (Jour. Amer. Med. Assoc., Oct. 18, 1924) expresses a recent view of many in stating that operations for chronic appendicitis do not yet yield a satisfactory proportion of cures, owing to errors in diagnosis. Our Associate Editor, Robert T. Morris (Ibid., Sept. 27, 1924), classifies chronic appendicitis in adults under 4 separate categories: One low grade infective and 3 non-infective, irritative lesions. The irritative lesions are in scarred remains of appendixes, appendixes undergoing fibroid involution, and cases of lymphoid hyperplasia. In children the lesions are largely confined to 2: One low grade infective and 1 irritative, the latter seen in children with the "lymphoid diathesis." The peritoneal sheath of the organ not yielding to the lymphoid hyperplasia within, there is pain, colic and disturbance of the abdominal sympathetics, with tenderness on deep pressure, not at McBurney's point, but at the site of the fused ganglia of the lumbar sympathetics, a little to the right of and below the umbilicus.

According to T. A. Smith (Ann. of Surg., June, 1924), so-called sub-acute or chronic appendicitis in children is due to lymphoid hyperplasia in the appendix—not to inflammation—in the great majority of

cases, and this condition should therefore be recognized as a clinical entity. Of 37 such patients, 22 in girls, 60 per cent. were over 10 years old. The history was one of colicky pain of varying severity, often intermittent, usually beginning about the umbilicus and later localizing in the right iliac region. All had local tenderness or sensitiveness. Vomiting at the last attack before operation occurred in 24. In 29 the average leukocyte count was 10,700. In 16 the tonsils were enlarged. Even in long-standing cases, permanent relief uniformly followed appendectomy, except in 2 out of the 31 cases traced.

**DIAGNOSIS.**—According to I. W. Held (Amer. Jour. Med. Sci., June, 1924), the fact that the chronic appendix results from a previous acute attack is now generally accepted. The ordinary stomach ache of childhood, subsequently forgotten, in many cases represents actually an acute non-suppurative appendicitis, from which recovery occurred without operation. In the majority of cases of chronic appendicitis, the symptoms are too vague to permit of easy diagnosis. The writer endorses Sir Humphrey Rolleston's division of the symptoms into 4 groups: 1. Reflex; 2, mechanical; 3, toxic; 4, infective. The reflex symptoms are those resulting from hypertonus and spasm of the stomach, as well as failure of the pyloric or ileocecal sphincter to relax, leading to gastric or ileal stasis, and so to excess of There may be acid or toxemia. spasm of different parts of the colon, accounting for spastic constipation and sometimes marked pain over the sigmoid. Instead of spasm, there may be atony of the stomach or The reflex sensory phenocecum. mena consist of pain, epigastric or even thoracic, which is brought on by pressure over the appendix region. Secretory phenomena may predominate, with marked pyrosis, acid regurgitation and even vomiting. Primary disturbances in the vegetative nervous system may account for the variations in the reflex symptoms in different individuals and even in the same individuals. The mechanical symptoms result either from foreign bodies in the appendix, causing colic or persistent ileocecal discomfort if the organ is diseased, or, more important, from adhesions, which may extend to the cecum, ileum, hepatic flexure, liver and gall-bladder, or make pressure on the ureter or sciatic nerve, and which may form a palpable mass simulating a tumor in the ileocecal region. Toxic effects of absorption from the appendix comprise severe gastric hemorrhage (probably hemolytic), myocarditis, and simulation of hyperthyroidism or, more rarely, Addison's disease. Infective symptoms and effects include lassitude, moderate fever especially after exercise, chilliness, increased pulse frequency; simulation of pulmonary tuberculosis; small pulmonary emboli, pleurisy, and local thrombophlebitis of the iliac veins.

In the absence of a history of 1 or more acute attacks, the diagnosis of chronic appendicitis becomes difficult

The symptoms affording little diagnostic help, Held deems the following objective findings of importance:

(1) Tenderness in the ileocecal region.

- (2) Rigidity over the right rectus, sometimes present, especially if there are pericecal adhesions.
- (3) Gastric hyperacidity, less often subacidity.
- (4) Aaron's sign: Pressure in the appendicular region causing epigastric pain.
- (5) Bastedo's sign: Ileocecal tenderness on colon inflation, present in a few cases, chiefly with adhesions.
- (6) Tenderness over the appendix region on giving an enema (rare).
- (7) Reder's sign: Tenderness upon rectal examination (very rare).
- (8) Rovsing's sign: Pain over the appendix region upon pressure on the left side at a point corresponding to McBurney's on the right.

The writer noted that in retrocecal appendicitis the pain, although persistent over the right loin if pressure is exerted there, is referred to the appendix region.

Roentgenography is also important in the diagnosis.

The following causes of failure of relief by appendectomy were found by Bettmann (loc. cit.) in a series of private cases: Inadequate study of the patient (imperfect indication for any operation), 66 cases; symptoms due to gastric or duodenal ulcer, 20; gall-bladder disease, 16; colitis, 12; misleading X-ray reports (all from leading roentgenologists), 10; genitourinary cases, 9; pulmonary tuberculosis, 9; neurasthenia, 8; ovarian disturbances, 5; inguinal hernia, 3; pinworms, 2; acid gastritis, 2; miscellaneous, 8; total, 170 cases.

Too much importance is attached, the writer believes, to right iliac distress. In chronic dyspepsia, when a careful examination, with modern methods, of the entire gastrointestinal tract and the urinary and pelvic organs fails to reveal a satisfying cause, persistent or recurring tenderness at McBurney's point is suggestive, but not pathognomonic nor even decisive. Of 127 patients traced 1 to 5 years after operation, 43 per cent. still had tenderness at McBurney's point as marked as ordinarily seen in unoperated patients. Right iliac tenderness is often absent on some days; some patients have pain whenever the cecum is distended. Correct clinical diagnosis of chronic appendicitis usually demands protracted observation and study. Hasty diagnosis yields only about 60 per cent. of correct guesses. The roentgenologist who makes a positive diagnosis from apparent tenderness of the filled appendix will often err; cecal distention with the barium mixture often causes tenderness even in the absence of disease. Exploratory laparotomy is not always harmless; of 300 patients, 35 complained of serious disorders traceable to the operation itself, most commonly hernia, ileac stasis, omental and other adhesions, and neurasthenia. Inquinal hernia may simulate acute or chronic appendicitis with intense right iliac pain, constipation and prostration, but in hernia fever and leukocytosis are absent; the inguinal rings should be carefully examined.

Riesman (Jour. Amer. Med. Assoc., Oct. 18, 1924) states that the X-ray is of but little help except in so far as it shows stasis and pronounced ptosis. In persons without ptosis and not pronouncedly neurotic, constant or intermittent tenderness in the right lower quadrant, especially when gastric symptoms are marked, usually justifies a diagnosis

of appendicitis, and operation gives good results. In the neurotic group, a fattening process, with a suitable abdominal binder, does more good than operation.

Bruce-Porter (Lancet, Sept. 6, 1924) reports a case of referred pain in the right nipple area in chronic appendicitis. The patient cried out and placed his hand over this area when pressure was made over the appendix. After appendectomy the chest pain disappeared. The appendix showed evidence of recent and former inflammation, with a few adhesions in the pelvic region.

In a case described by Bassler (Jour. Amer. Med. Assoc., May 19, 1923), the condition simulated angina pectoris, a burning sensation and then distinct pain in the chest coming on 1 week after the onset of an acute abdominal attack with fever and vomiting. The attacks of chest pain were of varying duration, and came and ceased suddenly. The heart and vessels seemed normal on physical examination. There was moderate abdominal ptosis and a tender appendix. Removal of the diseased appendix resulted in cessation of the chest attacks.

In regard to X-ray diagnosis, L. Levyn (N. Y. Med. Jour., June 6, 1923) does not consider prolonged retention of barium in the appendix without local sensitiveness as calling for operation. A visualized appendix retaining barium after the cecum has emptied, with sensitiveness to fluoroscopic palpation, constitutes, however, one of the evidences of chronic disease. Other such evidences include: Inability to visualize the organ because of its obliteration, along with a tender cecum; persistent kinking or constrictions; concretions; adhesions; reflex pylorospasm. Ileac stasis, considered a sign by some, often occurs in normal or appendectomized subjects. Absence of adhesions can be assumed if the appendix and cecum are freely movable. The appendix is best viewed after the 9th hour. Serial observations show that it moves from 1 area to another. Its size and position are of no significance in the absence of other signs.

The significance of prolonged filling of the appendix with the opaque medium is also discussed by A. Czepa (Wien, klin, Woch., July 3, 1924). He observed some patients without the least history of appendicitis symptoms in whom the appendix filled at the 4th hour and remained filled for over 24 hours, emptying nearly always, however, within 48 hours. He considers that filling for 24 to 48 hours is not diagnostically conclusive, though longer periods point to an abnormal condition. A definitely unusual shape of the appendix, e.g., a sharp bend near its tip, is very significant.

C. G. Mixter (Jour. Amer. Med. Assoc., Sept. 27, 1924) stresses the value of negative X-ray evidence in ruling out ureteral stone, calcareous ileocecal glands, or disease of the hip or spine. Roentgenograms of the urinary tract, dorsal and lumbar spine, pelvis and hips should be obtained in every case. Extreme retention of barium suggests angulation or interference with peristalsis by adhesions or stricture. Fixity and tenderness of the caput is, perhaps, the most important finding. In childhood, the barium meal normally passes the ileocecal valve in 6 hours. In chronic and subacute appendicitis, one frequently encounters a 6-hour gastric residual, due to spasm of the There is frequently a pylorus.

marked ileac retention at this time, caused by reflex ileocecal spasm or, more rarely, a mechanical cause, angulation or adhesions.

According to the X-ray observations of B. C. Cushway and R. J. Maier (Radiol., Dec., 1923), there is a relationship between the symptoms and the X-ray findings in chronic appendicitis which may be expected to hold good in at least 90 per cent. of cases. Thus, (1) Difficulty in swallowing, slight retrosternal pain or fulness: Tendency to cardiospasm. (2) Regurgitation, vomiting and eructation: Spasticity of cap, atony and stasis in the stomach. (3) Loss of appetite and weight, and malaise: Stasis, colitis and spasm of ileocecal valve. (4) Hyperacidity, epigastric pain and tenderness: Hyperperistalsis, marked pylorospasm and spasm of the duodenal bulb. (5) Pain and localized tenderness in the right side: Abnormally low or high appendix. (6) General abdominal tenderness: Extensive colitis. Each of these symptom-groups accompanies a visible, irregularly filled, fixed and tender appendix.

L. Kuttner (Med. Klin., Apr. 20, 1924) regards as a valuable indication of chronic appendicitis a failure of the opaque suspension to leave the appendix after 2 tablespoonfuls of castor oil have been taken to empty the bowel. He also takes the patient's temperature in the rectum and the axilla after a walk. In appendicitis the difference between the 2 readings is often greater (0.8° C.—1.44° F.) than normal.

TREATMENT.—The trend of recent opinion in regard to the operative treatment has been toward the conclusion that in the type of chronic appendicitis marked by recurrent attacks appendectomy gives very satisfactory results, but that in the more numerous cases in which a history of previous attacks is not available to support the diagnosis of appendiceal disease, the results of operation are

much less certain. Mixter (loc. cit.), reporting on 100 cases in children up to 13 years of age, notes that out of 70 postoperative reports of pathologic findings, 20, or 28.5 per cent., described the condition as "normal appendix," although in 8 of these evidence of chronic appendicitis had been observed at operation. There was no operative mortality. Followup reports in 50 cases showed that in 62 per cent, there had been no return of symptoms, while improvement was stated by the parents to have occurred in 28 per cent., and failure in 10 per cent. Of the girls, 17 per cent. were unimproved, and of the boys, but 6 per cent.-a difference due probably to the much more frequent occurrence of pyelitis in girls, with the attendant risk of an error in diagnosis. Appendectomy should be advised for chronic or subacute appendicitis when, by a careful differential diagnosis, all other possible causes of the symptoms have been excluded.

F. N. G. Starr (Northwest Med., Sept., 1924) lays stress on ileocecal regurgitation and cecal mobility and stasis as causes of the symptoms of chronic appendicitis, and for purposes of treatment divides the cases into 4 groups: (1) Cases with a mobile but not markedly atonic cecum, dragging on the superior mesenteric vessels and crowding the duodenojejunal junction. In these, constituting the bulk of all cases, the following measures are effective: Elimination of meat from the diet; a yeast cake night and morning; abdominal massage, physical drill, and a corset with an abdominal "lift," or even an ordinary abdominal belt with a rubber sponge under it.

(2) Cases in which these measures fail, but the cecum is still an abdominal organ. These are usually cured by appendectomy, sharp division of the ileal link, and plication of the cecum after division of 2 fibrous bands, 1 at the junction of the cecum and ascending colon over the outer leaf of the mesentery and the other a sigmoid band fixing the sigmoid to the left broad ligament in females or to the pelvic wall in males.

(3) Cases in which the cecum is a pelvic organ, with atony and marked ileocecal regurgitation: Cured by appendectomy, plication of the cecum, and burying of the plicated margin into a 3 or 4 inch slit in the posterior parietal peritoneum.

(4) Cases far advanced, with marked atony and 3d degree incompetence of the ileocecal valve, in which appendectomy and adhesion-breaking operations have already been performed: Radial resection of the terminal ileum, cecum and ascending colon, followed by a temporary connection with rubber tubing and then an end-to-end anastomosis.

M. Brulé (Presse méd., Nov. 12, 1924) refers to the rather numerous cases with apparent symptoms of chronic appendicitis in which appendectomy results merely in disappearance or diminution of the pain in the right iliac fossa, but there persist or soon recur fever, dyspeptic disturbances, colitis, enterorenal or enterohepatic symptom-groups, etc. many cases referred to the writer for operation with a diagnosis of chronic appendicitis, treatment directed to the intestinal functions brought permanent relief without operation. Thus, a man aged 45 had suffered in childhood from vomiting spells and attacks of abdominal pain terminating in loose stools. Later he had been treated for dyspeptic symptoms, and sent to

Vichy for gall-stones. Finally, severe late pain after meals, with diarrhea, led to a suspicion of duodenal ulcer. Fluoroscopy disproved this but revealed a cecal tender point. When the patient was referred for operation the writer found both the appendix region and the whole ascending colon tender; in fact, the entire colon was sensitive and tympanitic. Under diet and other medical measures for a few weeks, the cecal pain and digestive symptoms disappeared and the patient was soon restored to health. Similar, though less prompt and perfect results are obtainable in neurotic women with colopathy and appendicular pain.

The rôle of chronic appendicitis in thyroid disturbance is brought out by R. T. Morris (Internat. Jour. of Med. and Surg., Apr., 1924). This applies both to infective and irritative lesions of the appendix. Appendectomy merely for an influence on the thyroid gland should, however, not be done. Removal of a chronic infective lesion of the appendix is of real value, provided foci of infection elsewhere are attended to. In the lymphoid form of irritative appendix, the operation is likely to fail because the appendix symptoms have formed only a small part of the whole picture. This is likewise usually true in cases with visceroptosis, though in this group many gastrointestinal symptoms will thus be arrested and the excitation at 1 end of the endocrin chain be halted, while the thyroid at the other end will cease to produce its own set of symptoms.

ARRHYTHMIAS.—AURICU-LAR FIBRILLATION.—This disturbance is now generally ascribed, not to contractile impulses arising independently from multiple foci in the auricle, but to a "continuous circus movement," consisting of a circular excitation wave coursing, c.g., about the orifices of the venæ cavæ, from which further waves are thrown off centrifugally to other portions of the auricles. Garrey found that the ring-like contraction waves might be multiple and shifting in location. The upper extremity of the auriculoventricular bundle receives, as a result, a rapid and irregular succession of stimuli estimated at from 350 to 600 a minute.

J. H. Musser, Jr., and T. McMillan (Pa. Med. Jour., Oct., 1922) consider the subjective symptoms of diagnostic value in arrhythmias. A majority of their patients with auricular fibrillation could tell very definitely the time of its onset, the commonest symptoms being precordial pain, general weakness and sometimes dyspnea. Others observed were palpitation, gastric symptoms, a beating sensation in the abdomen, epigastric pain on exertion, dizziness, fainting and cerebral attacks. Some patients had developed rather suddenly a gen-Precordial oppreseral weakness. sion and discomfort in the pericardial region was the main complaint in 7 out of 20 cases. This cleared up promptly under digitalis even though the irregularity persisted. Often patients went from fibrillation to normal rhythm without any amelioration of the symptoms, showing the latter to be due rather to myocardial insufficiency than to the irregularity. Cases of auricular fibrillation with slow ventricular rate will go along for years in apparent perfect health. J. D. Heard (Ibid.) notes that gastric distress and vomiting accompanying the onset of fibrillation may be wrongly ascribed to gall-bladder or appendix disease. While there are no symptoms characteristic of auricular fibrillation, at least \%\_0 of the cases can be recognized without laboratory methods.

The polygraphic features of this condition are given under HEART, GRAPHIC MBTHODS IN THE EXAMINATION OF, Vol. V. The electrocardiographic features are summarized by W. E. Garrey (Physiol. Rev., Apr., 1924) thus: The electrocardiogram shows persistent oscillations of the string, which are irregular in tempo and magnitude; like the venous pulse variations, they occur throughout the cycles, but are best noted in the period of ventricular rest. They do not, however, correspond to the oscillations recorded synchronously on the venous pulse. These oscillations are definitely due to the continuous activity of the auricle but no P wave marks a definite auricular systole.

> The reaction to exercise of the heart with auricular fibrillation in the absence of signs of failure was studied by II. Blumgart (Heart, Jan. 30, 1924) in 9 patients. Each patient or control placed 1 foot on a chair 17 inches high and lifted himself up on the chair with it 20 times, repeating the exercise with the other foot. The arrhythmic hearts showed a disproportionate rise in ventricular rate and delayed return to the preëxisting level. This delayed return was exhibited by the same patients even when the rhythm had been restored to normal, and was therefore not due to the fibrillation per se. Digitalis failed to protect the ventricles from the exaggerated response to exercise. When, in auricular fibrillation, the ventricular rate rises as a result of exercise, the auricular rate generally falls.

ETIOLOGY.—The age of 50 years was found by F. N. Wilson (Jour. Mich. State Med. Soc., Nov., 1923) to be generally the dividing line between the 2 commonest sources of auricular fibrillation, vis., mitral stenosis (the type of cardiac disorder due to toxic goiter) and chronic myo-

carditis. Of his 51 cases, 17 had mitral stenosis and 7, toxic goiter. The electrocardiogram is often useful in the separation of the 2 groups. Right ventricular preponderance suggests mitral stenosis, while left preponderance is against it. He believes fibrillation is nearly always associated with changes in the heartmuscle, usually serious; these may, however, be physiochemical rather than gross structural changes. According to A. W. Hewlett (Cal. and West. Med., Oct., 1924), there is no convincing evidence that the physiologic changes underlying fibrillation necessarily depend upon serious organic heart disease, and various clinical observations indicate that sometimes the opposite is the case.

The predisposing factors, as stated by R. V. Patterson (Jour. Amer. Med. Assoc., Feb. 9, 1923), include impaired irritability of the myocardium and early myocarditis, the latter often associated with sclerotic changes in the arteries and kidneys. Among the exciting causes are toxins, various alkaloids and perverted actions of the nervous system. Brief fibrillation may be the first obtrusive manifestation of and occur comparatively early in progressive cardiovas-The prognosis of cular disease. fibrillation depends largely on the condition of the myocardium.

TREATMENT.—Digitalis having, through many years, established its position as a valuable remedy in auricular fibrillation, little attention has been paid to it in the recent literature. J. Jensen (Lancet, Apr. 12, 1924), however, has reported clinical tests of the effects of massive doses of digitalis in fibrillating cases dyspneic on exertion but without obvi-

ous failure. The tincture was given to a total of 3 to 3½ drams (12 to 14 c.c.) in 12 hours' time. Usually the heart rate dropped in 12 hours after the initial dose, the average fall being 10 beats per minute. Next morning and later on that day a further fall of 10 beats occurred. The quality of the pulse was much improved. The total duration of the effect was from 4 to 14 days. There was no definite diuretic effect in any case. The patients all felt better and they had less palpitation. Nausea and vomiting were never seen, and apart from occasional coupling of the pulse in 2 cases there were never any indications of overdosage. As noted by Wilson (loc. cit.) the usual procedure in using digitalis in fibrillation is to give enough to reduce the ventricular rate to 60 or 70 while the patient is at

Numerous contributions have been appearing on the use of quinidine sulphate. J. Wyckoff and M. Ginsburg (Boston Med. and Surg. Jour., May 8, 1924) report on 25 cases. Where rest in bed, a salt-poor diet and limitation of fluids to 1000 c.c. a day for 3 days failed to improve, drugs were given, some cases receiving digitalis first and quinidine after the symptoms of heart-failure had subsided, while others were given quinidine at once. Test doses of 0.2 Gm. (3 grains) were first given; then, the next day, 0.4 Gm. (6 grains) every 2 hours for 5 doses unless normal rhythm reappeared or toxic effects occurred; if these results did not occur the same dosage was continued for a week. Of 22 cases of persistent fibrillation, 63.6 per cent. were restored to normal

rhythm, including all of 9 arteriosclerotic cases and 41 per cent. of 12 cases of rheumatic etiology. Patients fully digitalized responded to quinidine just as often as others. Untoward symptoms such as tinnitus, vertigo, nausea and palpitation occurred in 40 per cent. of cases. One case developed sudden, but transient cardiac collapse. Two cases died—1 suddenly and the other after coma and slowed respiration—about 12 hours after the last dose of quinidine.

According to S. Neuhof (Med. Jour. and Rec., Sept. 3, 1924), who reports 11 cases—in 5 of which quinidine caused a lasting restoration of normal rhythm,—quinidine sulphate, with proper case selection, may be given to digitalized cases of fibrillation almost, if not quite, as safely in private practice, under the guidance of the family practitioner, as in the hospital. He had I fatal case, however, in which the drug led directly to cerebral and cardiac complications. This case is taken as illustrating the danger of giving quinidine in cases with venous thromboses, e.g., varicose veins with phlebitis, etc.

Hewlett (*loc. cit.*) specifies the indications and contraindications as follows: (1) **Quinidine** should not be given if emboli have occurred. (2) Any decompensation should be treated by the usual methods before using it, and unless there is improvement quinidine should be given cautiously or not at all. (3) It is indicated in fibrillation of recent onset and where signs of marked decompensation are absent. (4) If normal rhythm is reestablished, it is well to continue small doses of quinidine for weeks or

months. If the foregoing rules are followed the danger from quinidine is slight and the results from it often striking.

Four cases with electrocardiograms showing return to normal rhythm after treatment of auricular fibrillation are reported by L. F. Bishop (Amer. Jour. Med. Sci., Jan., 1923). Among them are cases of advanced circulatory disease with high blood-pressure and complaint of dyspnea and pain, and of heart disease following prolonged overwork, with symptoms of angina pectoris. The measures used consisted mainly of digitalis, diet restrictions, and fortnightly doses of castor oil.

According to T. B. Barringer, Jr. (Jour. Amer. Med. Assoc., Feb. 16, 1924), there are some patients with auricular fibrillation who are helped decidedly by graduated exercise, viz., the young or middle-aged, without valve lesions or history of heartfailure, but complaining of palpitation on exercise or mental excitement; the cardiac reserve power is not markedly decreased. In 1 case of protracted fibrillation following influenza in a man of 36 years, in whom swinging a 10-pound dumbbell 20 times raised the heart-rate to 162, with dyspnea, 2 months of graduated exercise by swinging dumbbells caused great improvement in all respects, with ability to swing 15-pound dumbbells 30 times without distress or abnormal circulatory reactions. Upon taking only 3 doses of quinidine sulphate of 0.4 Gm. (6 grains) each, his heart became regular and was still regular 21/2 years later. In another class of patients, with the reserve power much decreased, digitalis is required. In 1 such case, 53 years of age, slow progress was made in 6 weeks under digitalis and swinging 5 and 10-pound dumbbells, but upon restoration of sinus rhythm by a total of 11.7 Gm. of quinidine in 6 days, the same amount of progress on exercising was added in 11 days. He continued taking 0.5 Gm. (71/2 grains) of quinidine sulphate daily.

AURICULAR FLUTTER.—This disturbance, characterized by contraction of the auricle at a rate exceeding 200 and sometimes 300 per minute, usually with the ventricle lagging behind in accordance with a 2:1 or other block, is linked by Lewis with auricular fibrillation in that it results likewise from "circus movements." Impure flutter is distinguished from pure flutter in that local obstructions or barriers (a form of block) deflect the centrifugal excitation waves along new and sinuous paths. The waves thus spread less uniformly over the auricle. When the path of the central wave is also involved in the process, according to this conception, auricular fibrillation sets in.

The importance of electrocardiography in the diagnosis of auricular flutter was illustrated in a case reported by W. N. Horsfall (Med. Jour. of Austral., Mar. 15, 1924). Without it the condition would have been overlooked. An incomplete right bundle block, which persisted after return to normal rhythm, was also present. Digitalis alone failed in this case, but rapid improvement occurred on Guy's pills of mercury, squill and digitalis, suggesting that the condition may have been one of syphilitic involvement of the heart.

TREATMENT.—As noted by O. Montoro (Rev. med. cubana, Aug., 1923), digitalis is considered the best remedy, as a rule; it converts the flutter into fibrillation, which is then likewise eliminated. He reports a case of flutter in which there had been for 10 years attacks of dyspnea, palpitation and edema; digitalis given for a month in conjunction with quinine sulphate restored the heart

action to normal. K. Gordon (Can. Med. Assoc. Jour., Mar., 1924) similarly records 3 cases of restoration to normal rhythm under digitalis followed by quinidine sulphate.

A. M. Wedd (Ann. of Clin. Med., July, 1924), in 1200 electrocardiographic examinations, observed 137 cases of auricular fibrillation, 15 of paroxysmal tachycardia and 9 of auricular flutter. A clinical diagnosis of the latter can be made with assurance in many cases. It should be suspected in any regular tachycardia with a rate between 140 and 160. It occurs usually in adult males and is not commonly associated with chronic valvular disease, although it may occur in any type of heart lesion. It can frequently be recognized clinically by varying ventricular rhythms, one slower and irregular when at rest, and the other a regular tachycardia on excitement or exertion. If pressure on the vagus in the neck causes an irregular ventricular block, this will differentiate flutter from paroxysmal tachy-Fluoroscopy showed the cardia. condition of flutter in 4 out of 5 cases. The associated symptoms of flutter are dyspnea and palpitation, but it is less of a circulatory handicap than fibrillation. It seems certain that palpitation may result simply from increased auricular activity, for it continued in spite of slowing of the ventricular rate. In the treatment of flutter, the writer prefers quinidine to digitalis, on the ground that the best method of terminating a circus movement is to lengthen the refractory period of the auricle, thus making re-entry of this disturbance impossible. The preliminary production of fibrillation should preferably be avoided, and attempts made to convert flutter directly to normal rhythm by quinidine or a combination of it with digitalis. With the quinidine following the digitalis, the latter will protect against an excessive ventricular rate during administration of quinidine. Normal rhythm was restored by quinidine in 3 out of 6 cases. In 1 case, a single dose of 0.8 Gm. (12 grains) sufficed for this purpose.

ALTERNATING PULSE OR PULSUS ALTERNANS.—This condition is, as a rule, readily detected on mere palpation-especially upon administration of heart-tonics,-or by the sphygmograph or blood-pressure tests. According to R. Lyons (New Orl. Med. and Surg. Jour., Oct., 1923) the most delicate procedure is the auscultatory blood-pressure method, which reveals not only the alternation of systolic pressures of the strong and weak beats, but also the alternation of their diastolic pressures. The diastolic pressure of the strong beat is always lower than that of the weaker beat, a greater pulse pressure resulting. The prognosis of permanent alternation, present in 5 of the writer's 14 cases, is graver than that of transient alternation. Accompanying conditions comprised cardiac enlargement in 13 cases; arteriosclerosis, 13; hypertension, 12; dilated aorta, 9; renal disease, 9; angina pectoris, 2. In 9 cases the pulse was regular-a reason why pulsus alternans is frequently overlooked.

According to Regnier (Arch. des mal. du cœur, Sept., 1924), the gravity of the condition varies according to the amount of pressure in the arm-cuff required to elicit the

Where there is realternation. quired a pressure approximating the patient's systolic pressure, the disturbance is incomplete and the patient may live much longer. If only a pressure approximating the diastolic pressure is required, survival rarely exceeds a few months to a year. Alternation is elicited by constantly diminishing pressures in the unfavorable cases. The arrhythmia is ascribed to lack of participation of a portion of the muscle fibers, impaired by myocarditis, in some of the contractions. A. Navarro (Sem. méd., Sept. 18, 1924) considers low bloodpressure prognostically unfavorable in pulsus alternans.

TREATMENT.—As specified by Lyons, this consists mainly of prolonged, complete rest in bed, a low salt and low nitrogen diet, digitalis and, whenever feasible, the removal of infections and toxemias.

Combination of premature contractions with pulsus alternans, according to A. Clerc and G. Perrochaud (Bull. Soc. méd. des hôp. de Paris, July 19, 1923), tends to exaggerate and perpetuate the alternation. In their case, the added ventricular extra-systoles were revealed by electrocardiography. While such a combination portends grave myocardial disturbance, gradual improvement in their patient took place under digitalin, ouabain and theobromine; antisyphilitic medication added further benefit.

HEART-BLOCK.—Among 37 cases of complete block observed at the Mayo Clinic, F. A. Willius (Ann. of Clin. Med., Aug., 1924) found the greatest incidence in the 7th decade of life, in which there were 18 cases. The youngest case was 22 years, and

the average age, 53. Twenty-four cases were in males. Twenty patients (54 per cent.) had the Adams-Stokes syndrome; 6, congestive heart-failure; 6, merely dyspnea on exertion; 3, angina pectoris. Twentynine patients (79 per cent.) had distinct cardiac enlargement, and 7, slight enlargement. Seven had chronic endocardial valvular disease, while the remaining 30 all had systolic apical murmurs transmitted to the axilla, probably the result of left ventricular dilatation. The range of ventricular rate was from 22 to 48. Adams-Stokes seizures occurred in all 6 cases with the rate in the 20's, in 59 per cent. of the 17 cases in the 30's, and in 36 per cent. of the 14 cases in the 40's. The auricular rate ranged from 50 to 107. (In a few reported cases, the ventricular rate has exceeded the auricular in spite of complete block). The average systolic pressure was 166; diastolic, 72, and pulse pressure, 94; the strikingly high pulse pressure probably results from the increased output at each beat. Electrocardiograms pointed to left ventricular preponderance in 70 per cent. of the cases. Of 22 patients subsequently traced, 15 died from heart disease in an average of 7 months after examination; in 5, death occurred in Adams-Stokes at-The prognosis in complete block depends less on the block than on myocardial integrity and the occurrence of Adams-Stokes attacks.

In a case reported by C. Laubry and A. Mougeot (Bull. Soc. méd. des hôp. de Paris, Mar. 17, 1922), the ventricular rate was 18 in the morning and 12 to 14 in the evening. On brisk walking it dropped from 18 to 10, the latter rate continuing for several hours. Bosányi (Jahrb. f. Kind.,

Sept., 1922) observed heart-block and Adams-Stokes syndrome in a boy of 6 years, with the ratio 3:1 and pulse, 40. He had been healthy until the preceding 6 months.

Combinations of heart-block with various other arrhythmias are being reported. S. de Boer (Nederl. Tijd. v. Gen., Feb. 9, 1924) records a case of block in a woman of 60 with interstitial nephritis, in which there were periods of auricular flutter passing into auricular fibrillation, these periods of rapid auricular beat being accompanied by absence of the radial pulse, too brief to cause unconsciousness. Sudden slowing of the pulse to 30 or 40 sometimes followed 2 minutes of rapid pulse rate. L. Gallavardin and A. Bérard (Arch. des mal. du cœur, Jan., 1924) obtained a tracing of ventricular fibrillation in Adams-Stokes attacks in a woman of 55. The rate of ventricular fibrillation was 336. Abrupt cessation of this fibrillation accompanied return to consciousness. The patient lived a year before succumbing in an attack.

Intraventricular block, i.e., delay or blocking in the conduction system below the bifurcation of the bundle of His, was found by P. D. White and L. E. Viko (Amer. Jour. Med. Sci., May, 1923) to be of greater clinical significance than auriculoventricular block. Of 3219 cases electrocardiographed in a large hospital, the former condition was found in 130 and the latter in 156. The 130 cases comprised 41 of the more severe type, bundle branch block, i.e., high grade block of 1 of the 2 main branches of the bundle of His, which supply the left and right ventricles, respectively. The remaining 89 cases were of lesser degrees of intraventricular block, consisting of either partial block in the main branches or extensive lesions in the finer arborizations or both. The greater importance of intraventricular block, which requires electrocardiography for its detection, lies in that the mortality from heart failure in 71/2 years was higher in the cases with intraventricular block than in those with auriculoventricular block. Angina pectoris was 4 times more frequent. Arteriosclerosis was apparently responsible in 80 per cent, of the higher grade and in 59 per cent. of the lower grade of intraventricular block, and rheumatic fever and syphilis in smaller numbers of cases. Of the 41 cases of the bundle branch type, the right branch was affected in 40 and left in but 1. Eleven cases of sinoauricular block were also encountered. D. Hall (Brit. Med. Jour., May 3, 1924) alludes to strikingly distinctive ventricular complexes met with in the electrocardiogram in bundle branch block, and notes that in these cases the picture of right-sided or left-sided preponderance is not produced by increase in weight of the corresponding ventricle, but by defective conduction of impulses to the opposite ventricles.

According to Daniélopolu and Danulesco (Arch. des mal. du cœur., June, 1922), latent disease in 1 of the branches is readily ascertained by the test which consists in making pressure on the eyeball and thus exciting the vagus. Disturbed function of the bundle of His was produced in 1 healthy subject, but this is a rare result.

## ETIOLOGY AND PATHOGEN-

ESIS.—Complete heart-block may result either from lesions of the auriculoventricular node or bundle, depression of the bundle from vagal influences in certain healthy individuals, or poisoning due to asphyxia or drugs such as digitalis, strophanthus and squill. In Willius's (loc. cit.) series of cases, arteriosclerosis was present as a factor in 62 per cent., rheumatic fever in 19 per cent., diphtheria in 19 per cent., and influenza in 3 per cent. There was no proved instance of syphilis. Probably areas of calcification in the bundle are responsible in many of the arteriosclerotic cases.

According to P. Veil and J. Codina-Altès (Arch. des mal. du cœur, Dec., 1923), the conducting tissue may vary in its functioning in accordance

with the sinus rhythm, local metabolism or central or peripheral nervous factors. These writers also refer to the possibility of a reversed type of block, in which, although block of impulse conduction from auricle to ventricle is complete, impulses may travel in the opposite, upward direction. They observed this in 2 cases.

Impaired blood-supply to the conduction system may be a cause of some instances of heart-block, especially those of a transient or functional nature, according to L. T. Gager (Arch. of Int. Med., Apr., 1924). He observed marked reduction of conductivity in a case of large pericardial effusion in a man of 57; upon vagus pressure a 2:1 block was readily produced. Upon withdrawal of 500 c.c. of fluid from the pericardium the block disappeared, the systolic pressure at the same time receding from 190 mm. to normal. He ascribes the block to the pressure of the effusion on the coronary arteries and veins, as well as to the further coronary embarrassment due to compression of the auricles.

Congenital heart-block, proven by graphic records, has been reported in 13 instances, according to E. C. Romberg and P. D. White (Boston Med. and Surg. Jour., Apr. 3, 1924). Patency of the interventricular septum, which is located very near the auriculoventricular bundle, existed in almost all of these cases. In the writers' case, in a girl of 9 months, the symptoms were perspiration, irritability and cyanosis on crying. There was frequent arrhythmia and change of pace, with a loud systolic murmur. Electrocardiography showed a complete heart-block with auricular rate, 160, and ventricular, 70. A month later she was generally improved, though the block persisted.

TREATMENT.—According to H. Feil (Jour. Amer. Med. Assoc., Jan. 6, 1923), there is clinical evidence that adrenalin subcutaneously in partial heart-block may restore conduction to normal; in 2:1 block, either the mechanism may be restored to normal or dissociation may In complete block, normal sequence may result or else, usually, an acceleration of the auricles and Frequently recurring Stokes-Adams attacks may be abolished. The dose is 0.3 to 0.6 c.c. (5 to 10 minims) of the 1:1000 solution, and the effect lasts about 12 hours. In patients with a considerable degree of arteriosclerosis or with hypertension (and in many complete blocks there is high systolic pressure), the risk from adrenalin must be weighed against the risk and discomfort of the syncopal attacks. In no event should the drug be given intravenously.

> In the case of a man aged 44, reported by J. Parkinson and C. W. Bain (Lancet, Aug. 16, 1924), there was apparently an acute lesion in the myocardium involving the bundle, with a period of complete dissociation followed by gradual recovery of conduction. Adams-Stokes attacks occurred throughout. In 12 attacks, with 1 doubtful exception, adrenalin abolished the attack in 3 minutes. In complete block the ventricular rate was raised to 60, the block persisting; in partial block, both the auricular and ventricular rates rose to 120 and normal sequence was restored. dosage of 5 to 10 minims subcutaneously is advised.

Resection of the vagus was performed with success by H. von Hoes-

slin and R. Klapp (Klin. Woch., July 1, 1924) in a case of Adams-Stokes syndrome in a woman of 28. The disorder had followed a tonsillar operation, and each attack was combined with severe pain on the outside of the ear and dysphagia, suggesting a vagus neurosis restricted to the cardiac branches. The Adams-Stokes symptoms ceased after the operation; recurrent laryngeal paralysis was, however, produced.

In branch bundle block, according to O. V. C. E. Petersen (Hospitalstid., Sept. 20, 1922), digitalis is not contraindicated. He has given it with good effects and no harmful consequences in several cases. When syphilis is a factor, specific treatment may yield improvement.

PREMATURE CONTRACTION (EXTRASYSTOLE).—Extrasystoles are the result of generation and discharge of stimuli in portions of the myocardium other than the sinoauricular node. A. L. Smith (Ann. of Clin. Med., Nov., 1924) reports a study of the significance of this disturbance in 100 patients seen in office practice. The age ranged from 11 to 66 years. The symptoms varied from those of heart failure in 9 cases to none in 35 cases. The main complaints were of shortness of breath synchronous with the extrasystole and sensations of grabbing, tearing, grasping, palpitation, turning of the heart, a lump, jerking, emptiness, shaking or fullness. Coffee, tea, cocoa or tobacco seemed responsible in 21 cases, alcohol in 3, digitalis in 3, strychnine in 2 and aspirin in 1. Seven pregnant women had extrasystoles which disappeared after confinement. Extracardiac infections and toxemias seemed responsible in 31. In 14, no cause could be found. The extrasystole arose in the ventricle in 87, in the bundle in 8, and in the auricle in 5. The polygraph or electrocardiograph is necessary for such differentiation, which many consider of prognostic value. Of the 96 patients still living, normal rhythm returned on treatment in 56, though 7 of these develop extrasystoles on taking coffee or tobacco. From his study the writer cannot believe that the myocardium is impaired in any manner by extrasystoles, which may exist for long periods without any signs of heart failure developing.

On the other hand, P. S. Barker (Ibid., May, 1924), from a review of 193 hospital cases with extrasystoles, concludes that among such cases extrasystoles are an unfavorable prognostic sign. Even among the 76 extrasystolic cases without other signs of heart disease the mortality was notably high. Auricular extrasystoles were of more serious import than ventricular. T. W. Griffith (Brit. Med. Jour., Oct. 18, 1924) alludes to the fact that extrasystoles are more frequent in persons with cardiac valvular or muscular lesions or hypertension. Their very existence may lead to a severe neurosis. J. H. Musser, Jr., and T. McMillan (Pa. Med. Jour., Oct., 1922) state that auricular extrasystoles are usually symptomless, while the ventricular are of the type of which the patient is conscious.

TREATMENT.—Elimination of stimulants and of worry, overwork and late hours were found of much value by A. L. Smith (loc. cit.) in overcoming the irritability of the myocardium. Proper diet, regular

eating and sleeping hours, and sedative drugs are also serviceable. Any existing pathologic condition or functional abnormality should, if possible, be removed or corrected.

The utility of quinidine is pointed out by J. H. Musser, Jr. (Ann. of Clin. Med., Jan., 1924). The mechanism by which this drug has done harm in some cases of auricular fibrillation, vis., through dislodging of clots previously formed in the auricle by reason of the impaired auricular functioning, does not apply in other types of irregularities. In 60 per cent. of a series of patients with extrasystoles the writer obtained good results from quinidine sulphate. A woman of 56 who had been made extremely nervous by the irregularity, which had grown worse through several years, was placed on 0.75 Gm. (12 grains) of the drug 3 times a day after she had been in the hospital a week. Within 48 hours the irregularity had disappeared. The dosage was gradually reduced to 1 dose a day in the even-The extrasystoles were thus kept down to at most 1 every 3 or 4 minutes, instead of occurring as often as every 2 or 3 beats. In a woman of 73 with a systolic aortic murmur and a premature contraction about every third beat, 0.2 Gm. (3 grains) of the drug after meals resulted in normal rhythm, though sodium bromide had previously proven ineffective.

ARSENIC.—PHYSIOLOGIC ACTION.—Study of the phosphates, acidity and ammonia in the urine in patients receiving arsenic by Kramár and Tomcsik (Klin. Woch., Jan. 15, 1924) showed these factors to be increased in the majority of cases. This supports earlier observations on respiratory metabolism pointing to re-

duced oxidation as a factor in the anabolic effect of arsenic.

That arsenic in toxic amounts causes cell death by interference with the oxidative processes governed by glutathione is the conclusion resulting from researches by C. Voegtlin, H. A. Dyer and C. S. Leonard (Pub. Health Rep., Aug. 17, 1923). Hopkins had already found that compounds containing the SH group were concerned in processes of oxidation and reduction and isolated such a compound, known as glutathione, from tissues. Voegtlin and his coworkers found an SH compound in trypanosomes, to which arsenic is toxic, and believe that this agent in certain trivalent forms is a specific poison for the SH group.

UNTOWARD EFFECTS AND POI-SONING.—Pigmentation of the oral mucous membrane was observed by R. Stockman (Brit. Med. Jour., Nov. 10, 1923) in 2 cases. In the first, a woman aged 49 had been taking Fowler's solution for 6 years, to a total amount of 32,850 minims. In addition to extensive skin pigmentation and keratosis of the palms and soles, the oral and lingual mucosa was bluish throughout, with a deep blue area within the lower lip. In the second case, a man aged 57, with pernicious anemia had taken 2400 minims of Fowler's solution in the course of a month. Two weeks after the onset of skin pigmentation, bluish discoloration appeared within the lower lip and cheeks; on making pressure around the patches to render them bloodless, a light-brown color replaced the blue. The hard palate showed a brown area. In some persons small amounts of arsenic suffice to produce untoward effects; pigmentation, keratosis and neuritis may appear in a few weeks.

In a case reported by E. Strauss (Klin. Woch., June 24, 1924), the 4th injection of sodium arsenate into the arm for slow convalescence from what had appeared to be influenza resulted in immediate and recurrent severe pain radiating to the hand, followed by typical radial paralysis with reaction of degeneration. Operation was undertaken, revealing a neuroma on the musculospiral nerve as it curved around the humerus. Two longitudinal incisions were made in the neuroma to afford an exit for the edema, and function returned almost completely thereafter.

F. van Oppen (Nederl. Tijd. v. Gen., Sept. 15, 1923) reports a case in a girl of 14 who, after prolonged use of Fowler's solution for asthma, developed ascites, glycosuria, vomiting, brownish skin discoloration and loss of the patellar and Achilles reflexes. Operation and subsequent autopsy revealed partial bowel obstruction due to adhesive peritonitis, with hepatic cirrhosis. The adhesive peritonitis is ascribed to chronic arsenic poisoning.

In the treatment of poisoning by arsenicals H. C. Semon (Brit. Med. Jour., Apr. 12, 1924) advocates intravenous use of sodium thiosulphate in doses of 0.45 to 0.6 Gm. (7½ to 10 grains) in 5 c.c. (80 minims) of water, given on alternate days. Good results were thus obtained in a case of arsenical jaundice and 1 of acute dermatitis following sulpharsenol injections.

THERAPEUTICS.—Intravenous use of arsenicals, such as neoarsphenamin, in ulcerative stomatitis is recommended by E. A. Morgan (Amer. Jour. Dis. of Childr., May, 1923) on the basis of experience in 25 cases. Improvement began, on an average, 2½ days after injection and cure was complete within 6 days. Local application of Bowman's solution (Fowler's solution and wine of ipecac, of each 12 c.c., and glycerin, 8 c.c.) to the gums was effective, but relief was not always permanent. In 8 cases the 2 procedures were used simultaneously, but the period of cure was no shorter than after intravenous injection alone.

## ARSPHENAMIN.—PHYSIOLO-

GIC ACTION .- Numerous communications have been appearing of late on the fate of arsphenamin in the body upon introduction by intravenous or other routes. A. C. Kolls and J. B. Youmans (Johns Hopk. Hosp. Bull., June, 1923) found that about 34 of the arsphenamin given intravenously leaves the blood stream in a few minutes after completion of the injection, and the remainder is rapidly reduced in amount, though traces may still be found after 24 hours. The drug is stored in the liver, spleen, kidneys, lungs, and cardiac and skeletal muscle. There is evidence that already 3 hours after injection the amount of the drug has been appreciably reduced by alteration, excretion or both. The liver is a more important excretory organ for arsphenamin and neoarsphenamin than the kidney. The brain shows a much lower concentration than any other organ. The cerebrospinal fluid during the first 24 hours, if it contains the drug at all, does so only in minute concentration.

Blood analyses by J. A. Fordyce, I. Rosen and C. N. Myers (Amer. Jour. of Syph., Jan., 1923) immediately after intravenous arsphenamin injection showed only 37.9 of the arsenic administered present in the blood; this corresponded to 3.71 mgm. of metallic arsenic per 100 Gm. of dried specimen. Observations at 5-minute intervals showed a further gradual lowering of arsenic content up to 1 hour, when the amount became almost stationary.

In regard to the distribution of arsenic after intravenous administration, F. M. R. Bulmer (Jour. of Pharm. and Exp. Ther., June, 1923) found the salient features to be its high concentration in the liver very shortly after injection; the rapid lowering of this concentration, presumably by elimination with the bile; the relatively large amount in the lungs, especially after large doses, persisting at least several days, and its retention by the long bones over a longer period than in any other tissue. The latter feature is perhaps significant in view of the therapeutic use of arsenic in anemias.

Various observers have found arsenic in the spinal fluid after intravenous administration. L. II. Cornwall and C. N. Myers (Amer. Jour. of Syph., Apr., 1923) confirmed this with regard to silver arsphenamin, finding it in the spinal fluid after 2 hours in an amount as large as 143 mgm. per 100 Gm, of dried specimen, and in even larger amounts after 72 hours. The experiments of Rudolf and Bulmer (Amer. Jour. Med. Sci., Jan., 1923) in rabbits led them to conclude, however, that upon intravenous injection of arsenic little if any of it actually reaches the central nervous tissues; similarly, when it is given in therapeutic doses intrathecally none of it can be detected in the spinal cord. They deem it unlikely that any good effects in cerebrospinal syphilis from intrathecal injection of arsphenamized blood serum can be due to the presence of any of the drug in the cord, but must be explained in some other way.

Fordyce, Rosen and Myers (Amer. Jour. of Syph., Oct., 1924) find differences of excretion between different members of the arsphenamin group. Tryparsamid is excreted rapidly through the urine, arsphenamin and silver arsphenamin very largely through the feces, and neoarsphenamin largely through the urine but mainly through the feces. A relationship between the late arsenical reactions and failure to excrete was also shown. Conditions such as jaundice or dermatitis may delay excretion.

The same observers (*Ibid.*, Jan., 1923) found in 12 nursing mothers that after intravenous arsenical medication the presence of arsenic in the *breast milk* is more constant than in either the blood or urine; arsenic is found in appreciable amounts long after its administration. The amount of arsenic received by a nursling in its feedings is probably sufficient to be of some therapeutic value. Energetic treatment of syphilitic mothers during lactation is therefore advisable.

Investigating the reason for the known action of arsphenamin in hindering blood coagulation, J. Oliver and E. Douglas (Arch. of Derm. and Syph., May, 1923) found no effect of the drug on thrombin or its precursors but observed a marked change in the properties of the fibrinogen and other globulins of the plasma, which were rendered incoagulable by heat or thrombin, but not destroyed, since they could be recovered by precipitation with carbon dioxide. In the therapeutic use of arsphenamin, the concentration of it required to produce definite changes of coagulability is never reached.

Testing the bactericidal action of neoarsphenamin on cultures of spirochetes in vitro, Pons (C. r. Soc. de biol., Oct. 31, 1924) demonstrated such an action even in a 1:200,000 dilution. Whole blood, serum, urine and kidney tissue from a rabbit that had received the drug showed the same spirocheticidal property.

MODES OF ADMINISTRATION.— The intravenous route of administration continues to meet with general approval, although, according to S. de Aja (Siglo med., Aug. 23, 1924), intramuscular use is indicated in old tertiary and quaternary lesions and, in general, for cautious, gentle medication, as in latent syphilis, as well as in cases in which intravenous administration is impracticable. J. Bejarano (Rev. esp. de urol. y derm., Apr., 1924) advocates intramuscular use in tabes dorsalis when but 1 symptom of the disease is in evidence, as intravenous administration may provoke appearance of its other manifestations.

In regard to the intravenous dosage, the same observer advises against exceeding a dose of 0.6 Gm. of neoarsphenamin in men and 0.45 Gm. in women; this reduces the chances of a fatal reaction to 1:162,800, whereas with larger doses they are 1:3000. The initial dose should be small—0.15 Gm.—to try out the patient's tolerance. In giving a series of injections the total dosage should not be less than 2 Gm., as a smaller amount is likely to do harm. On the other hand, the maximum total dose is from 4 to 5 Gm. The total number of doses should always exceed 3 or 4, as such a small series may activate nerve lesions.

From experience in the treatment of 132 infants and children with congenital syphilis, almost all of whom received neoarsphenamin intravenously, G. Gelbjerg-Hansen (Ugeskr. f. Laeger, Oct. 11, 1923) concluded that infants are even more tolerant of the arsenical drugs than adults. The injections were usually given in a vein of the elbow or neck, or in the superior longitudinal sinus as a last resort. The dose was 0.075 Gm. below 3 months, 0.09 between 3 and 6 months, and 0.12 between 6 and 12 months. In children over 8 years old, 0.3 Gm. was given. The largest number of injections in any case was 29.

In feeble patients and those intolerant of arsphenamin Weitgasser (Med. Klin., Jan. 27, 1924), rather than give the painful intramuscular injections, prefers to give the drug intravenously in solution in 20 c.c. of a 50 per cent. solution of glucose.

Administration of arsphenamin by the mouth was tried out by A. Renault (Bull. Soc. méd. des hôp., Mar. 9, 1923), 0.4 or 0.5 Gm. being given every 2, 3 or 4 days to a total of 2 to 6 Gm. The treatment, however, proved unreliable.

Administration by the rectum was studied by Noeggerath and Reichle (Arch. f. Kinderh., July 21, 1923) in 8 children, 0.3 to 0.6 Gm. of neoarsphenamin being used. Arsenic appeared in the urine to the extent of 0.15 to 0.34 per 1000, as compared to 2.53 per 1000 after a dose of 0.15 Gm. given intravenously. Retention of the enema is, of course, a prerequisite to absorption, and opium seemed of little assistance in this connection.

Administration by way of the inferior turbinates is feasible, according to Podestá (Semana med., July 24, 1924), as a substitute for the intravenous route where the latter is not available. The solution having been slowly injected into the spongy tissue of the turbinate, the needle is allowed to remain in situ a few seconds before withdrawal, after which a small tampon of iodoform gauze with petrolatum is applied to check the bleeding. The tampon is permitted to remain until the next day.

Pooled arsphenaminized fortified serum, especially for the treatment of paresis, is described by J. G. Marthens (Amer. Jour. of Syph., Apr., 1924). In this procedure, serums from 20 to 25 patients receiving intensive intravenous treatment are poured into a common beaker and thoroughly mixed. The serum from each is prepared by withdrawing 45 to 60 c.c. of blood ½ hour after the arsphenamin injection into dry sterile 15 c.c. centrifuge tubes, keeping in the ice-box for several hours, and then centrifuging for 10 minutes, or until all the erythrocytes are excluded. The pooled serum is inactivated on a water bath, and I hour before use is "fortified" by addition of 0.5 to 1 c.c. of a solution made by adding 0.5 Gm. of old salvarsan to 150 c.c. of warm, sterile distilled water, alkalinizing with sodium hydroxide, and diluting 10 c.c. to 35 c.c. with 0.5 per cent. saline solution. After this addition to the serum, inactivation for 20 minutes is carried out. Upon receiving the injection of fortified serum intraspinally, the patient remains in bed for 48 hours. The intraspinal injection is preceded by an intravenous injection given the day before. The first course of treatment comprises 16 weekly intravenous neoarsphenamin injections and 10 intraspinal injections of the fortified serum at longer intervals. Next mercury inunctions are given daily for a month, with potassium iodide by the mouth. This is followed by 3 months of rest, next a course of 6 intravenous injections followed by mercury rubs, and the iodide is given again and repeated every 3 months.

THE NEWER ARSPHENAMIN DE-RIVATIVES AND ALLIES.—Silver Arsphenamin.-According to W. A. Whitman (Med. Jour. and Rec., Sept. 17, 1924), silver salvarsan has a higher therapeutic value than neosalvarsan. In comparative trials of each in 55 cases of tertiary syphilis, he was led to conclude that the silver compound causes less in the way of toxic effects than the neo compound. Of the cases treated with silver salvarsan, 43.5 per cent. became Wassermann-negative, 23.6 per cent. remained strongly positive, and 32.9 per cent, responded to treatment. In the case of neosalvarsan the corresponding percentages were 34.5, 21.8 and 41.8. Silver salvarsan occurs as a brownish black powder, readily soluble in water at room temperature, and containing about 20 per cent. of arsenic and 15 per cent. of silver. A solution of 0.1 Gm. of silver salvarsan in 40 c.c. of 0.4 per cent. sodium chloride solution was employed by the writer. The initial dose was 0.1 Gm., and 0.2 Gm. was given in all the other doses except the last, when 0.3 Gm. was used. About 4 minutes were allowed in injecting the drug. The silver salvarsan was preceded by mercury salicylate, potassium iodide and mercury bichloride, up to 15 weekly treatments in The corresponding doses of neosalvarsan given were 0.3, 0.6 and 0.75 Gm.

Sulpharsphenamin (Sulpharsenol).—The therapeutic results from the use of the older arsphenamins and silver arsphenamin in neurosyphilis leaving much to be desired, it has been concluded that these compounds fail owing to an insufficient penetrating power, which leaves some of the parasites unkilled, with resulting relapse after cessation of treatment. To overcome this deficiency, other compounds—in particular, sulpharsphenamin and tryparsamid—have been tried as agents possessed of greater penetrating power.

Sulpharsphenamin, in which both amino radicals of arsphenamin are stated to be replaced by methylenesulphonic acid groups, was first used experimentally and clinically in 1919 by Lévy-Bing, Lehnhoff-Wyld and Gerbay under the French designation sulfarsenol. In a 30 to 40 per cent, solution (0.4 Gm. in 1.2 to 1.5 c.c. of distilled

water), this drug can be injected subcutaneously or intramuscularly without excessive irritation. According to C. Voegtlin, J. M. Johnson and H. Dyer (Pub. Health Rep., Nov. 10, 1922), the drug is more stable than neoarsphenamin, both in powder and solution; is of much lower toxicity; is eliminated as rapidly by intramuscular as by intravenous injections, and possesses greater ultimate sterilizing power than neoarsphenamin. The same observers, with J. W. Thompson (Ibid., May 11, 1923) showed experimentally that penetration of the nervous system by the drug, given intravenously, is greater than in the case of the older arsenicals, and is comparable to that secured with tryparsamide, the most penetrating arsenical yet devised.

Among the more recent clinical reports is that of D. L. Belding (Arch. of Derm. and Syph., Apr., 1924), who found the drug as effective as neoarsphenamin in healing syphilitic lesions, but more apt to produce toxic disturbances, especially upon intravenous use of over 0.7 Gm. a week in a 68 kg. patient. Dermatitis occurred in 16 per cent. of 63 patients and varying degrees of peripheral neuritis, in no case pronounced, in 56 per cent. of 44 adult patients receiving intravenous injections. In the intravenous cases neuritis occurred only when the dose exceeded 34 the maximum standard for neoarsphenamin. Local reactions occurred oftenest when doses exceeding 0.3 Gm. were injected. The drug is well suited for intramuscular use in adipose women and children.

J. H. Stokes and C. W. Behn (Jour. Amer. Med. Assoc., July 26, 1924) dissent from Belding's conclusions as to the frequent toxic effects from sulpharsphenamin, having used a different preparation. They report on 126 patients with all types of syphilis who received intramuscularly 1360 injections of 0.3 to 0.6 Gm. With the epifascial technic they found sulpharsphenamin of the brand they used could be injected without significant reaction and with no more discomfort than the ordinary mercurial injection. Doses over 0.4 Gm. should be divided between the 2 buttocks. Subcutaneous injection is therapeutically less effective. A 30 to 40 per cent. solution was used, and stress is laid on complete emptying of the 2 c.c. syringe by having a small bubble of air above the injection fluid to clear the needle. Three per cent. of toxic reactions were obtained, 2 patients having fever and 2, exfoliative dermatitis. Therapeutically, sulpharsphenamin intramuscularly proved quite as effective as arsphenamin and neoarsphenamin as to spirillicidal action and effect on the blood Wassermann and spinal fluid reactions, the healing of lesions and general well-being.

The compound appeared distinctly superior to the older drugs in neurosyphilis and superior to neoarsphenamin intravenously in all aspects of syphilis. It is well borne by patients with cardiovascular disorders, if used in moderate dosage.

Sulpharsenol is deemed nearly ideal for employment in *children* by G. Ahman (Hygiea, Aug. 15, 1924). Subcutaneous injection in a 6 per cent. solution is preferred. In cases in which arsphenamin had not given entirely satisfactory results, the newer drug proved its efficacy.

Taking the chemotherapeutic index (i.e., the maximum tolerated dose over the minimum effective dose) as the criterion of therapeutic efficiency, G. W. Raiziss, M. Severac and J. Moetsch (Jour. Amer. Med. Assoc., Nov. 29, 1924) found that sulpharsphenamin, on the basis of tests in rats infected with *Trypanosoma equiperdum*, is considerably inferior to arsphenamin and at most ½ as efficient as neoarsphenamin. Its efficiency was practically the same whether given intramuscularly or by vein.

Tryparsamide.—This compound, chemically n-phenylglycine-amide-p-arsonic acid, was synthesized by Jacobs and Heidelberger at the Rockefeller Institute. Its arsenic content is 25.32 per cent. Its main features are given by W. H. Brown and L. Pearce (Jour. Amer. Med. Assoc., Jan. 5, 1924) thus: A moderate degree of trypanocidal action and slight but definite spirocheticidal action; an unusually high penetrability which enables it to develop a high actual as compared with its potential parasiticidal action, and a remarkable power of reinforcing processes of natural resistance and promoting recuperation.

Recording 1 year's experience with it in paretics in the Philadelphia General Hospital, F. G. Ebaugh and R. W. Dickson (Jour. Amer. Med. Assoc., Sept. 13, 1924) report encouraging results in 52 cases.

The drug was given intravenously in weekly doses of 3 Gm. (in solution in 10 c.c. sterile distilled water) over a period of 10 weeks. Eight weeks' rest was given after each course of 10 injections. Careful preliminary eye studies were made in each case, and optic atrophy of any degree was ruled out. Of 36 cases in a state of "organic psychosis with functional coloring," 10 were so improved as to be discharged and return to work. In 5 with "transitory psychosis," all were similarly improved. This compared with only 5 cases discharged from the same ward in 1922. The drug frequently gave good results in spite of only meager and transitory serologic improvement. There was marked improvement in the physical condition of all cases, with increased hematopoiesis. One case developed optic atrophy following the first course of tryparsamide. Two had neurorelapses, which responded to further treatment. The writers regard the drug as the best so far advanced for general paralysis.

Similar conclusions are reached by J. E. Moore, H. M. Robinson and R. S. Lyman (Ibid., Sept. 20, 1924), who regard the drug as of particular value in early general paralysis, meningovascular neurosyphilis and the majority of cases of tabes. In primary and secondary syphilis, and in tertiary syphilis without nervous involvement, its therapeutic effect is so slight as to preclude its use. (Even repeated doses of 7 Gm. failed in primary and secondary cases). In early neurosyphilis, the comparatively feeble spirocheticidal value of tryparsamide precludes its use unless in combination with an arsphenamin. Visual disturbances occurred in 17.8 per cent. of 241 cases, but in only 2.8 per cent. was there noteworthy permanent visual injury. This untoward effect may be largely obviated by ophthalmologic control of treatment, yet should restrict the use of the drug to neurosyphilis and trypanosomiasis. Before treatment, the visual acuity, fundi and visual fields should be carefully examined in each case. Reëxamination must be carried out at the first appearance of subjective visual disturbance. At this point, objective injury, if present, is usually so slight as to leave useful vision if the drug is permanently withdrawn.

Further experiences with tryparsamide are reported by H. C. Solomon and H. R. Viets (Ibid.) who treated about 100 cases of neurosyphilis. The conclusion reached was that in some instances the drug gives results better than are obtainable with the older methods, but in other cases does not give as good results. One effect on the spinal fluid was very striking, the cell count being nearly always reduced to normal after 6 or 8 injections. Globulin and total protein were somewhat reduced in many cases. The other spinal fluid findings were not more improved than by other methods. In tabes the results were, on the whole, good, though not as favorable as with the elaborate intraspinal treatment. Four cases in the series developed considerable amblyopia, in 3 of which a permanent defect remained.

According to W. I. Lillie (*Ibid.*, Sept. 13, 1924), ocular changes occur as often after arsphenamin as after tryparsamide. The arsenicals appear efficient in decreasing ocular changes in central nervous syphilis.

Aminohydroxyphenylarsonic Acid.—G. W. Raiziss and I. Tulchinsky (Urol. and Cut. Rev., Oct., 1924) state that this compound has proven to be an energetic antisyphilitic which causes rapid disappearance of primary and secondary lesions. Because of its low toxicity and definite curative effect. it may be recommended in syphilis when other arsenicals are poorly borne. In the acute stages of yaws, the disease may be cured with it in 3 or 4 days, the intramuscular route of injection being used.

POISONING AND UNTOWARD EF-FECTS.-As noted by W. Wechselmann (Urol. and Cut. Rev., Dec., 1924), complications due to the arsphenamins are steadily diminishing in spite of the very widespread use of these drugs. He states that in ordinary doses arsphenamin is not toxic, but prolonged circulation of it in the blood, due to delayed elimination because of prior infectious disease or other causes, may result in its conversion into the toxic arsenic oxide. This may injure the epithelium of the capillaries and render these vessels permeable to fluids. Hence the eruptions and central nervous manifestations sometimes witnessed. Simultaneous use of mercury and arsphenamin results in serious impairment of elimination by the former drug, eruptions resulting from the capillary injury thereby engendered. Similarly, according to this observer, the brain symptoms are due to capillary injury, with consequent edema, extravasation of red cells and purpura cerebri, wrongly termed encephalitis hemorrhagica. The drug has no actual neurotropic action.

G. W. Raiziss and H. Brown (Arch. of Derm. and Syph., July, 1924), from experimental work, deem it possible that many of the reactions following the arsphenamins are only secondary manifestations resulting from injuries sustained by the kidneys. In rabbits, 1 large dose of 150 mgm, of neoarsphenamin per kilo. caused acute nephritis, though multiple therapeutic doses of 15 mgm. did not injure the kidneys. Neoarsphenamin, weight for weight or on the basis of arsenic content, proved less than half as injurious to the kidneys as arsphenamin. Clinically, the renal function must be carefully noted before and during the treatment.

True toxic effects from neoarsphenamin are, according to Milian (Paris méd., Mar. 1, 1924), neither anaphylactic or colloidoclastic in nature, but are analogous to the effects of fatal doses in rabbits, featured in particular by general vascular dilatation, serous effusions and exophthalmos. A selective action of the drug on the endocrinsympathetic system is thereby indicated, and these complications occur where some part of this system is impaired by syphilis or other preëxisting diseases. In Addison's disease and exophthalmic goiter the drug is poorly borne. The chief vasomotor manifestations are mucocutaneous or visceral nitritoid crises, serous apoplexy and vesiculo-edematous erythrodermia.

NITRITOID CRISES.—The mechanism of these crises has been somewhat elucidated by the studies of I. Rosen, E. F. Müller and C. N. Myers (Arch. of Derm. and Syph., Sept., 1924), who state that every intravenous injection of arsphenamin is followed by a slight decrease of leukocytes in the peripheral vessels of the entire body. It is known that this decrease is influenced by stimulation of the autonomic nervous system and its sympathetic part. Thus, every injection of arsphenamin has a direct influence on the autonomic nervous system.

The angioneurotic symptoms sometimes following arsphenamin are objectively manifest in a marked decrease of leukocytes in the peripheral vessels. Epinephrin prevents this decrease of leukocytes. The same observers (*Ibid.*, Nov., 1924) note that most persons exhibiting the nitritoid crisis after arsphenamin do not react in this way to silver arsphenamin. Since injections of this drug are generally unattended with any change in the leukocytes, the indication is against any disturbance of the involuntary nervous and vascular systems.

Endocrin disturbances predispose to nitritoid crises, according to Lévy, Juster and Lafont (Ann. des mal. vén., Feb., 1923). Thyroid changes may occur during treatment. The physician should be on his guard against toxic effects from arsphenamin in cases with irregular menstruation, transient edema, or other vasomotor or endocrin symptoms. Weakness, lassitude in the morning and apathy point toward adrenal insufficiency.

A form of localized nitritoid crisis is emphasized by Bertaccini (Policlin., May 28, 1923) from experience with 5 cases of edema of the extremities and moderate cyanosis developing less than 1 hour after arsphenamin injection; 17 other cases receiving the same preparation failed to show any untoward effect.

Treatment.-In the case of the early, immediate reactions such as sudden syncope, edema of the lips, tongue or an extremity, severe headache, substernal constriction with dyspnea, abdominal cramps, etc., or of combined phenomena such as follow amyl nitrite inhalation, S. S. Greenbaum (Therap. Gaz., Oct., 1924) finds that subcutaneous or intramuscular injection of 71/2 to 15 minims (0.5 to 1 c.c.) of 1:1000 adrenalin chloride with 1/150 grain (0.0004 Gm.) of atropine sulphate will in most instances decrease or prevent the reaction, provided it is given not less than 15 minutes before the arsenobenzene injection. Flandin's manner of drawing blood into the arsenobenzene solution immediately before injection appears of some value. The curative treatment is the same.

**SKIN ERUPTIONS.**—The early delayed or intermediate reaction to arsphenamin, developing in 3 to 24 hours, consists, as described by Greenbaum (*loc. cit.*), of 1

or all of the following: chilliness, headache, nausea, vomiting, diarrhea, tenderness over the liver, urobilinuria, fever, malaise, erythematous rash, and localized or generalized edema. Lowering the dose usually prevents their repetition. Among the late toxic reactions, occurring after 24 hours, is dermatitis, frequently preceded by premonitory signs such as localized or generalized pruritus, erythema on the arms and legs, numbness and tingling in the fingers and toes, and hypersensitiveness of the skin (e. g., to tincture of iodine). When the dermatitis occurs early, i.e., after the 1st or 2d injection, these premonitory signs are wanting. Dermatitis persists from a few days to 4 or more months. An apparently mild form may progressively become very severe. All forms are later complicated by secondary infection of the skin, scalp and eyes, as well as by a secondary fever.

According to J. H. Stokes and E. P. Cathcart (Arch. of Derm. and Syph., Jan., 1923), chronic focal and acute prodromal or intercurrent infections form a part of the complex on which arsphenamin skin reactions develop.

Raynaud, Montpellier and Lacroix (Bull. Soc. méd. des hôp. de Paris, June 22, 1923) report a case of scarlatinoid eruption following the 30th daily injection of arsphenamin. Subsequently, as little as 1 mgm. of the drug sufficed to produce intense anaphylactic shock and eruption. Sodium bicarbonate was used with moderate success as preventive.

H. E. Miller (Cal. State Jour. of Med., Nov., 1923) states that seborrheic dermatitis seems to predispose to arsphenamin eruptions.

Treatment.—Sodium thiosulphate, preferably given intravenously, was found by W. L. McBride and C. C. Dennie (Arch. of Derm. and Syph., Jan., 1923), markedly to shorten the course of arsenical dermatitis. It also proved a successful neutralizing agent for acute and chronic mercurial poisoning. When pure, it is non-toxic in doses up to 2 Gm. The treatment is based on the detoxicating, precipitant action of sulphur salts on metals. According to M. R. Groehl and C. N. Myers (Therap. Gaz., Oct., 1924), the drug assists by producing new soluble products of the metal, which

are probably thiosulphuric acid derivatives of a complex protein compound. Intravenous use (0.6 Gm. daily) results in more rapid excretion and a more abortive effect than oral use (30 Gm. daily). A useful preventive measure is to give the arsenical in a dilute solution in 0.4 per cent. sodium chloride, allowed to stand 15 to 20 minutes before injection. Dilution in concentrated lactose or glucose solution (2 to 4 Gm. of the sugar) is also a preventive measure, but it reduces the therapeutic activity of the arsenical.

Sodium thiosulphate was injected intravenously in 3 cases by E. Hoffmann and H. T. Schreus (Münch. med. Woch., Dec. 14, 1923) in doses of 0.3, 0.45, 0.6, 0.9, 1.2, 1.5 and 1.8 Gm. on alternate days, the solution being reboiled before use. Excellent results were obtained. C. R. Bugg and C. Folkoff (Bull. Johns Hopk. Hosp., Mar., 1924) gave 4 intravenous injections to a total of 1.35 Gm. in a child of 27 months with eczematous and exfoliative dermatitis, the skin lesions almost disappearing in 6 days.

Greenbaum (Jour. Amer. Med. Assoc., July 5, 1924), on the basis of Voegtlin's observation that certain sulphydryl (SH) compounds possess detoxifying effects on arsenoxide, prefers thiosinamin, a substitute sulphydryl compound, to sodium thiosulphate. It is soluble in 2 parts of water and its action, when given intravenously, is extremely rapid. The drug is used from ampules containing 3 grains (0.2 Gm.) of it in 6 c.c. (96 minims) of distilled water, with 1 or 2 drops of 2 per cent. glycerin added to insure permanent dissolution. The ampules are sterilized in the autoclave. The average daily dose is 1 ampule. The drug yielded excellent results in a large number of cases, seemingly inhibiting the dermatitis almost at once.

JAUNDICE.—This complication, according to Greenbaum, may be either toxic or syphilitic (Jarisch-Herxheimer reaction and hepato-recurrence). Differentiation is not always possible, and is usually based on the amount and regularity of the treatment. The premonitory symptoms—lassitude, malaise, anorexia, chronic headache, insomnia—and the laboratory findings—delayed phenoltetrachlorphthalein elimination and hyperbilirubinemia—indicate an on-

coming jaundice of toxic type if observed during a regular series of arsenobenzene injections.

According to J. F. Schamberg and H. Brown (Jour. Amer. Med. Assoc., June 14, 1924), the organ dominantly attacked by the arsphenamins is the liver. Blood bilirubin determinations by the van den Bergh quantitative test will often disclose pathologic amounts of bilirubin before clinical evidences of jaundice are present. By occasional determinations in patients receiving arsenical therapy liver damage may in some cases be averted. Anything over 2 parts of bilirubin per million of blood is regarded as excessive. In 2 cases referred to it rose to above 150 in the presence of jaundice, then receded to normal as the jaundice passed off. The test appeared valuable in determining when a damaged liver will permit the resumption of treatment. E. Kahn (Münch. med. Woch., Apr. 6, 1923) favors the simple urobilinogen test of the urine as a criterion of injury to the liver.

Treatment.-Duodenal lavage is recommended by L. F. X. Wilhelm (Arch. of Derm. and Syph., Oct., 1924) on the basis of experience in 33 cases. The stomach is first washed through the tube until the return is clear. The duodenum is then washed with water at 40° C.; 100 c.c. of saturated magnesium sulphate solution is then washed back and forth in a 100 c.c. syringe for 10 minutes, after which the duodenal contents are permitted to syphon out. Upon repetition of this procedure 3 or 4 times at 1/2 hour intervals, the treatment is concluded by washing out the stomach. One to 8 such treatments on alternate days were given, the average required being 2. Other measures employed were: Acid sodium phosphate; oxgall tablets; calomel and a saline purgative; glucose solution proctoclysis in severe cases; diet rich in carbohydrates and fresh fruits, with restriction of meats.

Greenbaum (loc. cit.) deems the best treatment available to be biliary drainage in combination with daily intravenous injections of thiosinamin and a diet rich in carbohydrates.

In 28 cases of chronic arsphenamin poisoning treated by H. D. Lloyd (Boston Med. and Surg. Jour., Apr. 10, 1924), in-

cluding 16 of jaundice, 11 of dermatitis and 1 of hyperpyrexia, a portion of the cases were treated with a fat-free diet, forced fluids, purgation and local skin measures, while the others received intramin intramuscularly in addition.

HEMORRHAGES .- P. Emile-Weil and Isch-Wall (Presse méd., July 28, 1923), reporting 10 cases of hemorrhage such as epistaxis, hemoptysis, bleeding from the gums, menorrhagia and purpura, warn against persistence in arsphenamin treatment where there is the least hemorrhagic tendency. In mild cases, injections of human blood proved effective; in the severe ones, repeated blood transfusion, 200 to 300 c.c., was availed of. Other measures comprise proctoclysis of glucose solution containing a maceration of 100 Gm. of hog's liver, and 40 drops of adrenalin solution by the mouth. For resumption of treatment, bismuth seemed preferable to mercury. There was always intolerance of the arsphenamins in cases with abnormal bleeding time.

A case of death from anemia due to persistent hemorrhages within 2 weeks after 0.6 Gm. of arsphenamin in a hemophiliac is reported by J. Rosenbloom (Jour. of Lab. and Clin. Med., Oct., 1923). The drug is contraindicated in hemophilia.

ANEMIA.—Many cases are met with suffering from profound blood derangement following the use of antisyphilitic remedies, according to L. Stern (Med. Jour. and Rec., Jan. 16, 1924). In such patients he has found valuable intravenous injections of iron cacodylate from ampules each containing 1 grain in 5 c.c. An accurately prepared and tested preparation is requisite.

Jacobsohn and Sklarz (Klin. Woch., July 8, 1924) found experimentally that excess of potassium enhances the toxicity of the arsphenamins. An excessive vegetable diet may favor such a toxic action clinically. Calcium chloride in 10 per cent. solution in 5 c.c. ampules, given along with the neoarsphenamin, which is dissolved in it, counteracts this form of toxicity, as clinically noted in cases in which, without the calcium, nephritis or eruptions had previously developed. The calcium solution must be injected slowly and the drawing of blood into the syringe avoided.

ARTERIES.—LIGATION.—In ligating the first part of the *left sub-clavian* artery, A. K. Henry (Brit. Jour. of Surg., Jan., 1923) does a costotransversectomy at the level of the 2d rib on that side. Upon depression of the pleural dome, the vessel is exposed from the aorta to the 1st rib, the ansa subclavia, however, crossing it. The branches, except the thyrocervical trunk, can also be rather readily ligated with this procedure.

OBLITERATION.—R. Leriche (Bull. Soc. chir. de Paris, Dec. 14, 1923) alludes to a reliable procedure for the differentiation of arterial obliterations from spasms, Babinski and Heitz having shown that in a warm bath the pulsations will always reappear in the presence of spasm but not in obliteration. This test is of service in suspected impairment of the circulation in the lower limbs.

RUPTURE.—The 7th case on record of traumatic rupture of the iliac artery without lesion of the abdominal wall or pelvic fracture is reported by G. Jean (Jour. de chir., Mar., 1923). The vessel, held in place by a fold of the iliac fascia, is crushed against the bony pelvis. Only 1 case recovered. Operation is imperative as soon as the condition is suspected. If there is contusion without rupture, the thrombus, if recent, should be removed by arteriotomy and both ends of the vessel ligated. If all 3 layers are torn, compression of the aorta (Momburg procedure) should be promptly carried out, treatment given for shock, and later, an ample incision made and suture or ligation performed. In the writer's case, the external iliac artery and vein-the latter with 3

-

tears—were ligated, but death took place in 15 minutes.

SUTURE.—A. Avramovici (Lyon chir., Nov.-Dec., 1923), in suturing the larger arteries in dogs, found it useful to insert a glass rod into both ends of the vessel and suture over it until only space enough remains for its withdrawal.

SYMPATHECTOMY (DE-CORTICATION).—In Leriche's periarterial sympathectomy, as described by J. F. Mitchell (South. Med. Jour., Aug., 1924), the artery—e.g., the femoral or brachial—is exposed for 8 or 10 centimeters and raised from the common sheath with tapes or rubber tissue. After making a longitudinal incision in the adventitia, the whole outer coat, with the surrounding fibrous tissue, is removed with the knife, scissors or blunt dissector. The object of the procedure is to restore normal conditions by eliminating the morbid vasomotor stimulation which is the cause of circulatory and trophic changes. Nine such operations were carried out by the writer, 7 dealing with the femoral artery and 2 with the brachial, all in cases of the general type of Raynaud's disease. Partial or complete relief followed in all. Other disturbances for which the operation has been advocated include acrocyanosis, causalgia, endarteritis obliterans, vasomotor trophic neuroses with contractures, and painful or ulcerated am-P. Drevermann putation stumps. (Münch. med. Woch., Nov. 9, 1923) performed 8 such operations for obstinate varicose ulcer; the trophic results were unsatisfactory but the pain disappeared. In a case of perforating ulcer of the foot a distinctly better effect was noted.

TRANSPLANTATION.—In a case of aneurism of the popliteal artery seen by E. Birt (Deut. Zeit. f. Chir., clxxix, 269, 1923), about 25 centimeters of the artery was resected and replaced by a transplant from the saphenous vein. The line of suture was embedded in the musculature. Healing followed satisfactorily, without cessation of arterial flow, and 6 weeks later pulsations in the transplant could be distinctly felt.

ARTERIOSCLEROSIS.—DIA-GNOSIS.—According to C. Trunecek (Rif. med., June 18, 1923), a perceptible pulsation in the supraclavicular fossa, with the wave traceable to the axilla, points to sclerosis and dilatation of the thoracic aorta. Other evidences include an abnormal dulness over the vessel and at the right of the sternum, and an exaggerated, metallic second aortic sound.

Primary sclerosis of the pulmonary arteries is indicated, according to W. Mobitz (Deut. Arch. f. klin. Med., Mar. 30, 1923), by the combination of a diastolic pulmonary murmur with enlargement and insufficiency of the right heart, cyanosis, and clear heart sounds. X-ray examination should be carried out. The patients in this disorder are relatively young.

Capillaroscopy is deemed a diagnostic help by A. Crespo (Arch. de card. y hem.. June, 1924) in the detection of early arteriosclerosis. If, upon giving nitroglycerin, no resulting capillary dilatation is seen, a definite indication of the disease exists. A negative test, however, does not exclude a progressive arteriosclerosis.

The clinical features of coronary sclerosis, verified at necropsy in 86 cases, are discussed by F. C. Willius

(Minn. Med., Sept., 1924), who was led to divide the cases into the following 5 groups: (1) Typical angina pectoris, 24 per cent. of the cases. (2) Atypical angina, usually in the upper abdomen, 2 per cent. (3) Progressive myocardial failure without painful attacks, 26 per cent. (4) Myocardial failure together with typical anginal attacks, 3 per cent. (5) Occult coronary sclerosis, without sufficient evidence for a clinical diagnosis, 40 per cent. In the lastnamed condition, electrocardiography is diagnostically very helpful, most commonly showing inversion or negativity of the ventricular T-wave. Among other findings in the writer's series of cases were: Coronary occlusion, 15 per cent.; diseased thoracic aorta, 99 per cent.; diseased abdominal aorta, 21 per cent.; syphilis, 9 per cent.; valvular changes, 50 per cent.; myocardial degeneration, 100 per cent.; infarction, 8 per cent.; combined arteriosclerosis of the peripheral vessels, 70 per cent.; of the kidneys, 37 per cent.; cerebral arteriosclerosis, 13 out of 15 brains; gallbladder disease, 26 per cent.; hypertension, 31 per cent., and sudden death, 37 per cent.

In a review of 100 cases of cerebrospinal arteriosclerosis, G. E. Price (N. Y. Med. Jour., Oct. 3, 1923) found vertigo the commonest symptom, occurring in 46 cases. About 1/4 of the patients were amnesic for recent events. Headache and paresthesia were common. The pupils were small and sluggish in 25, and arcus senilis existed in 16. Deafness was marked in 8 and moderate in 8. Over 1/4 of the cases had apoplectic seiz-Sensory symptoms were insignificant and motor paralysis slight. Attention is called, however, to the frequent occurrence of the symptomgroup of ataxic paraplegia. gressive mental deterioration and emotional instability were common to all the cases. The age at which the symptoms had first been noticed averaged 60.9 years. I. J. Sands (Ibid.) dwells, in particular, on confused states following infections in individuals with cerebral arterioscler-After a mild infection, a number of patients previously under treatment for arteriosclerosis developed fear reactions, anxiety, hallucinations of sight and hearing, and a trend toward delusions of persecu-These patients were later amnesic as regards the acute period of their mental illness. They improved both generally and mentally under rest in bed, forced fluid intake and care of the alimentary tract. As soon as the blood-pressure, previously depressed, had returned to over 150 a distinct turn for the better seemed to occur and recovery could be foretold.

ETIOLOGY AND PATHOL-**OGY.**—Experiments in rabbits by L. H. Newburgh and S. Clarkson (Arch. of Int. Med., May, 1923) showed that prolonged ingestion of considerable amounts of animal protein by these animals results in atherosclerosis of the aorta and several other arteries, these vessels exhibiting a primary disease of the intima with fatty degeneration and hyperplasia of the elastic tissue. The diets given contained from 26.8 to 36.2 per cent. of protein. Several workers had tried to prove that the vascular lesions in rabbits fed animal diets are due to the intake of cholesterol rather than the excess of protein, but the writers believe their experiments exclude the former possibility, thus restricting the origin of the vascular lesions to the protein. [The experiments would, it seems, be more significant as regards the causation of arteriosclerosis in man could similar vascular changes be produced by protein overfeeding in an omnivorous animal rather than an herbivorous animal such as the rabbit.—Ed.]

The rôle of lipoid substances in the etiology of arteriosclerosis is emphasized by Mönckeberg Woch., Aug. 19, 1924), who describes the disease as comprising 2 processes, viz., degenerative deposits of lipoids and regenerative proliferation. The former process results from disturbed cholesterol metabolism, which may not, however, be associated with an increase of this substance in the High blood-pressure may contribute to the degenerative process and hasten its development. The degenerative process and the regenerative proliferation mutually predispose the one to the other, and usually coexist, though they may be present independently. N. Onitschkow (Virchows Archiv, Apr. 16, 1924) found that in rabbits fed on a cholesterol-rich diet until hypocholesterolemia appeared and then given vegetables until it passed off, the aorta showed marked atherosclerosis whereas the internal organs showed practically no lipoid deposit. dently the vessel walls are particularly retentive of the lipoid. Disturbed cholesterol metabolism is to be regarded as the exciting factor in the production of the arterial changes. H. Pribram and O. Klein (Med. Klin., Apr. 27, 1924) observed

an increase of cholesterol in the blood-serum in most cases of high blood-pressure. R. Thoma (Virchows Archiv, Sept. 19, 1923) states that the presence of fats, lipoids, calcium, etc., in the walls of the affected vessels should not be considered the cause of the tissue proliferation in these walls, but a manifestation of the metabolic disturbance present as well as of locally increased tension. He also favors the view that the marked differences in the degree of vascular disease in different regions in the individual case are the result of unequal demands made on the mechanism of vessel-tone regulation.

L. Hess and W. Weiner (Wien. klin. Woch., Apr. 9, 1923) found that dipping 1 foot of puppies alternately into very cold and warm water resulted after 100 days in morbid changes in the elastic fibers of the media. R. Geigel (Münch. med. Woch., May 4, 1923) concludes that the tortuosity of sclerotic arteries is due, not to the blood-pressure, but to the tendency of the circulating blood to push the vessel along with it as its walls lose their elasticity.

Two types of vascular sclerosis are recognized by L. M. Warfield (Ann. of Clin. Med., Jan., 1924): (1) Intimal, nodular or atherosclerosis, produced by infectious toxins or excess products of protein metabolism, and constituting a rather slow process. (2) Medial or senile, or the Mönckeberg type of arteriosclerosis, apparently a more acute process (experimentally, at least), and possibly a degenerative one. The latter type is rarely associated with chronic nephritis and hypertension, but in the former type the circulating poison produces widespread capillary contraction, and as the tissues must have blood, the heart has to contract more strongly. This is further enhanced by spasm of the small arterioles supplying the glomeruli. The cause being toxic, there is reactive inflammation and eventually the glomeruli are destroyed, whereupon the renal tubules atrophy and dilate or are shut off by fibrous tissue contraction. Excessive meat eating seems harmful to both the arteries and kidneys.

In a study of 100 cases, J. P. O'Hare and W. G. Walker (Arch. of Int. Med., Mar., 1924) noticed a clear contrast between cases with advanced arteriosclerosis of the peripheral vessels (radials, brachials and temporals), but normal retinal vessels and blood-pressure, and cases with sclerosis of the retinal vessels and high blood-pressure. Evidently the peripheral vessels play little or no part in producing hypertension. It is sclerosis of the smaller vessels, such as the retinal arteries (which serve as an index of small vessel sclerosis), that causes high pressure. Ophthalmoscopic examination thus assumes great value. Retinal changes coexisting with low blood-pressure suggest an earlier hypertension which has disappeared or lessened through heart weakness.

Arteriosclerosis resulting from thyroid deficiency is stressed by A. M. Fishberg (Jour. Amer. Med. Assoc., Feb. 9, 1924). In myxedema there are well-marked arterial changes, and many cases develop the typical picture of hypertension with resulting myocardial insufficiency and cerebral hemorrhage. The necropsies before the introduction of thyroid treatment showed in the majority of cases marked arteriosclerosis and chronic

interstitial nephritis. In the writer's case of thyroid atrophy there was hypertension with sclerosis both of the larger vessels and the arterioles in various organs.

Arteriosclerosis

TREATMENT.—This is divided by F. B. Utley (Atlantic Med. Jour., Mar., 1924) into the causal treatment and the palliative treatment. The former includes the removal of foci of infection, e.g., in the teeth, tonsils, sinuses, ears, gall-bladder, appendix or genitourinary tract; the prevention of chronic intoxications, as by alcohol, tobacco, lead, intestinal stasis, and proper treatment of acute or chronic infectious diseases. In acute infections all means should be taken to increase fluid intake and improve elimination by all avenues. Tuberculosis, gonorrhea, rheumatic fever and syphilis in particular should be treated promptly and thoroughly to shorten the period of vascular drain-The diet should comprise  $\frac{2}{3}$ to 1 Gm. of protein per kilo. of body weight (in adults), with enough fats and carbohydrates in addition to meet caloric needs. The food should be distributed evenly in the 3 meals. Exercise, relaxation, recreation and 8 or 9 hours of sleep are of great importance, and hurry and worry must be avoided.

In the palliative treatment, warm baths, woolen clothing and moderate exercise are advised to relax the skin vessels and peripheral arteries. For those who cannot exercise enough, massage is a good substitute. Hydrotherapy is helpful, but the extremes of heat and cold should be avoided, especially in hypertension. Iodides are without influence on fatty or hyaline degeneration and calcification of the vessel walls; they

are of most service in syphilitic cases and help improve the cerebral and asthmatic symptoms. Head fulness or vertigo is often relieved by hydrotherapy, attention to the alimentary tract and alkali diuretics. For nocturnal polyuria, fluids should be reduced to a minimum after 3 or 4 p. m. and all irritants such as condiments and meat extractives be excluded from the diet. Paresthesias are best met by counterirritants and massage in the direction of the venous return.

According to R. Paolucci (Morgagni, Jan. 6, 1924), there is usually, in arteriosclerosis, an increased viscosity and coagulability of the blood. The former, in particular, he regards as one of the factors, through augmented resistance to the flow of blood in the vessels, in the production of the vascular lesions. therefore gives sodium citrate, a reducer of viscosity, in these cases. As a preventive of oncoming arteriosclerosis in those predisposed to it he orders a protein-low diet, prohibits stimulants, prescribes open air life, breathing exercises and calisthenics, and gives sodium citrate, 30 Gm. (1 ounce) daily by mouth in 2 or 3 doses between meals in not over 100 c.c.  $(3\frac{1}{3})$  ounces of an aqueous menstruum. In established arteriosclerosis of mild or intermediate severity, the daily amount of citrate is increased to 50 to 100 Gm.  $(1\frac{1}{2})$  to  $3\frac{1}{3}$  ounces), and potassium iodide, 15 to 30 drops of a saturated watery solution, added. In severe cases the iodide is omitted but the citrate given regularly in full dosage. The diet is lactovegetarian, diuretics are prescribed, and regular blood-letting carried out to forestall cardiac insufficiency by reducing hypertension and the blood viscosity.

R. Wilson, Jr. (Jour. So. Carol. Med. Assoc., Sept., 1923) notes that study of the protein retention assists in determining how much protein may be permitted in the diet. Iodides may be definitely harmful in cases with overacting thyroid glands. Where the heart gives evidence of weakening, digitalis should be given irrespective of the level of blood-pressure.

In intestinal arteriosclerosis, according to F. W. Strauch (Münch. med. Woch., Jan. 19, 1923), the earliest symptoms may consist either of abdominal pain, a sensation of fullness, abrupt hyperacidity or idiosyncrasies. These cases are very often intolerant of the nicotine of tobacco. Drugs indicated include theobromine and sometimes atropine and papaverine.

ARTHRITIS.—A. ACUTE AR-THRITIS.—ETIOLOGY.—There has long been an impression that the rheumatic infections tend to run in families. J. M. Faulkner and P. D. White (Jour. Amer. Med. Assoc., Aug. 9, 1924), in this connection, made an investigation of the families of 200 rheumatic cases, including altogether 1235 persons. In 71 families, or 35.5 per cent., more than 1 member had rheumatic infection, 8.79 per cent, of the 1235 exposed persons being infected. Comparison with 75 control families of the same social and economic status showed that families of rheumatic patients are more than twice as apt to have another member with a rheumatic infection as families of nonrheumatic persons. Some evidence was obtained against the theory of hereditary predisposition to the disease.

The joint involvements are regarded by R. Ehrström and J. Wahlberg (Finsk. Läk. Handl., Jan., 1923) as merely episodes in the course of rheumatic infection, the main feature being the heart involvement and the disease a chronic rather than acute one. The heart disease and the chorea due to the virus attacking the nervous system in the intervals between acute joint flare-ups usually develop without fever, and were neither warded off nor therapeutically influenced by salicylates.

Troisier, Raoul and Leboucher (Bull. Soc. méd. des hôp. de Paris, Dec. 28, 1923) have observed cases of acute multiple joint involvement following diffuse *dental pains* in the absence of alveolar abscesses.

The value of bacteriologic examination in all cases of arthritis not obviously of rheumatic origin is stressed by A. S. Grubb (Brit. Med. Jour., Sept. 13, 1924). While pneumococcus arthritis occurs oftenest in children, his case was in a man of 25 and appeared solely in the left knee 3 weeks after recovery from a severe diarrhea. In 2 weeks there was marked fluctuation, and flaky yellow fluid containing pneumococci was obtained. Under subcutaneous injections of antipneumococcus serum rapid improvement occurred and the next puncture showed absence of pneumococci. Extension of the limb with weights gave much relief from pain. The case would probably have ended fatally had its pneumococcic source not been discovered.

A. M. Chesney, J. E. Kemp and W. H. Resnik (Bull. Johns Hopk. Hosp., Aug., 1924) report 2 cases of an unusual syndrome featured by enlargement and tenderness of all lymph-nodes, acute polyarthritis, eosinophilia and fever. Both patients were syphilitic negroes. Rapid

recovery occurred under arsphenamin. In view of the involvement of the temporomandibular and sternoclavicular joints, there was a similarity in the distribution to gonococcal arthritis; 1 case, in addition, had painful heels. There was no evidence, however, of acute gonococcal infection, while inoculation tests with the lymph-nodes proved the presence of an active syphilitic infection and in 1 patient Spirochæta pallida was found free in the synovial fluid.

TREATMENT.—A strong plea for early massive dosage in the use of sodium salicylate in rheumatic fever is made by Daniélopolu (Presse méd., Dec. 15, 1923) on the ground that it will ward off cardiac involvement where smaller amounts would fail to do so. Heart involvement is the rule in insufficiently treated cases, and begins in the early stages of the disease. It is only during this time that the heart condition can be completely cured. Except for the acute ventricular dilatation described by Lees, once the first distinct clinical signs of heart involvement have appeared, the lesion, while it can be influenced by salicyl treatment, can never be wholly eradicated. In the last 12 years, whenever the writer has been able to apply the massive dosage within the first few days of the rheumatic infection, the heart has remained clear; this includes cases traced several years thereafter. On the other hand, whenever, in children or adolescents, early adequate dosage could not be given, the heart became affected; this was also frequently the case in adults. Sodium salicylate is the best drug to use, and substitution of any other salicyl compound for it yields inferior results. No serious untoward effects, such as delirium, coma or heart weakness, have attended the massive dosage provided each dose of salicylate is combined with twice the amount of sodium bicarbonate. A dosage as high as 30 Gm. (450 grains) of salicylate a day for 30 days was thus reached. The usual dosage starts with 8 Gm. (120 grains) a day in the adult, 5 Gm. (75 grains) in children of 8 to 12 years and 2 to 3 Gm. (30 to 45 grains) in children below 8 years. After 2 days, if there is no improvement, the dosage is increased by 1 or 2 Gm. (15 or 30 grains) a day, up to 15 to 18 Gm. (225 to 270 grains) a day in moderate cases in adults and 20 to 30 Gm. (300 to 450 grains) in severe cases. Once obvious improvement has begun, the dose reached is continued until the joint disturbances and fever have almost completely disappeared, when the dose is very gradually reduced, not exceeding a decrease of 1 or 2 Gm. every 2 days.

	SALICYLATE.	BICARBONATE
First 3 days	8 gm.	16 gm.
4th- 6th day	10	20
7th— 9th "	12 "	24 "
10th-12th "	14 "	28
13th-20th "	16 "	32 "
21st -24th "	14 "	
25th-28th "	12 "	28 '' 24 ''
29th-32d "	10 "	20 ':
33 d —36th "	8 "	16 "
37th-40th "	6 ''	12 "
41ct -12d "	1	2 "

In cases of intermediate severity the

schedule is as follows:

As the salicylate is eliminated very rapidly, it is given in equal doses every 2 hours in the day and every 4 hours at night. At night the patient must be wakened for the medicine. Each dose should be given in 100 c.c. (3½ ounces) of water and followed by a little food, especially starchy or sweet articles. If the patient brings up the medi-

cine, mainly because of its unpleasant taste, only 6 to 24 hours' interval should be allowed before resuming the earlier dosage. The intestinal functions should be carefully watched. Gentle laxatives assist rapid absorption of the drug and prevent accumulation of successive doses in the bowel. The writer has seen no harm from the use of sodium salicylate in rheumatic heart involvement, though progression in dosage is more cautious in these cases and arrhythmia may necessitate discontinuance of the treatment unless corrected by quinine or quinidine.

According to R. H. Boots and C. P. Miller (Jour. Amer. Med. Assoc., Mar. 29, 1924), neocinchophen is useful in some instances of rheumatic fever in which the salicylates fail to relieve completely or the patient is so susceptible to their toxic effects that adequate doses cannot be given. Toxic symptoms must be watched for in the same manner as in giving salicylates.

W. W. Duke (Jour. Amer. Med. Assoc., Sept. 15, 1923) believes that some of the local symptoms, such as pain and swelling, may be in part the result of an allergic reaction about the infected joints. He used epinephrin in several cases with brilliant temporary results, and deems this drug useful in the treatment. In hypertrophic, atrophic and chronic infectious arthritis it yields less, but often noticeable, temporary benefit.

B. CHRONIC ARTHRITIS.— ETIOLOGY.—Attention has been directed of late to allergy as the source of some cases of arthritis. According to J. A. Turnbull (Jour. Amer. Med. Assoc., May 31, 1924), if the removal of all foci of infection fails to benefit in arthritis, the diet should be investigated. Skin tests should be made and, in his experience, elimination of foods to which the patient is sensitive is quickly followed by joint improvement. Elsewhere (Boston Med. and Surg. Jour., Sept. 4, 1924) he notes that in vasomotor rhinitis, hay fever, asthma and bronchitis of anaphylactic origin one often meets with associated joint manifestations which are abolished by removal of offending allergens. One case mentioned was that of a woman aged 30, who had had rheumatism in various joints for 2 years. By skin tests she was found sensitive to corn, pork, cheese, flounder and tea. Upon elimination of these from the diet improvement began at once, and after 6 months she had no more pain. In a woman of 57 who had had arthritis of the fingers, hand and wrist for 7 years, and reacted to corn, pork, lamb, asparagus, lettuce, coffee and raspberry, removal of these articles from the diet gave relief from pain within 3 months.

The agency of chronic endocervicitis as a focal infection promoting chronic arthritis is brought out by L. M. Moench (Jour. of Lab. and Clin. Med., Feb., 1924). The streptococci of the cervix are, in particular, concerned and have an affinity for joint tissues. A modification of Kennedy's interstitial injection method, using anilin dyes, is advocated for the elimination of the cervical focus.

A form of chronic arthritis—endocrin arthritis—occurring in association with the menopause, normal or premature, is discussed by R. Neumann and E. Lande (Zeit. f. klin. Med., May 15, 1924). Thyroid disturbance may coexist. The cause of the joint dis-

order is regarded as being an overexcitation of the sympathetic system which, acting in conjunction with harmful extraneous factors, produces spasm of the vessels supplying the joints, with consequent disturbed nutrition of the latter. The sympathetic overexcitation, in turn, can be due either to the cessation of the inhibitory action of the ovaries on the sympathetic or to increase of the thyroid stimulation of the sympathetic.

In many cases of arthritis, especially the severe infective cases, and in muscular fibrositis G. L. K. Pringle and S. Miller (Lancet, Jan. 27, 1923) found a lowered glucose tolerance, which tended to return to normal with convalescence and recovery, most rapidly when foci of infection were removed. They regard the testing of glucose tolerance as of assistance both in the classification and prognosis of arthritis cases. Where tolerance is markedly low and the infective focus cannot be removed the prognosis is unfavorable.

TREATMENT.—While many cases of arthritis are due to some form of focal infection and improve or recover upon its removal, there are also many cases, as stated by R. Pemberton (Ann. of Clin. Med., Sept., 1924), that fail to recover on this principle alone. The electric light bake, he finds, results in loss of CO2 through the lungs, urine and sweat, and this produces increased alkalinity of the blood and sweat. The baking should not be pushed to the point of causing an intense alkalosis. In general, the agents which benefit the arthritic process are those which stimulate local or systemic metabolism or the local or systemic blood flow. These are exercises, massage, external heat, arsenic. radium when properly applied, nonspecific protein, thyroid extract and the X-ray. Arsenic is of especial value in cases with secondary anemia. Lightening the load placed upon the metabolism by reduction of food-intake is useful in well-nourished cases, especially of the atrophic or proliferative type. In most cases the proper ration is that yielding 30 calories per kilo. of weight under resting conditions. Some cases are

much benefited by vigorous colonic

massage and colonic irrigation.

There is no panacea, and reliance

should not be placed on 1 measure

alone.

The employment of sunlight in polyarthritis is advocated by B. W. Howell (Pract., Sept., 1924). All the limbs, and eventually the trunk, are to be gradually acclimatized to the rays, so that in time the skin becomes tanned. In some cases autogenous vaccines can be prepared; the organisms most likely to be the cause are streptococci, gonococci and the typhoid and dysentery organisms. Electric light baths, mud baths, paraffin-wax baths, diathermy and the actual cautery are all invaluable, especially as antecedents to a course of massage and electricity. In the later stages, much can be done by manipulation, splintage or operation, guided by orthopedic principles.

Coley's mixed toxins have been used by J. Klein (Atlantic Med. Jour., Dec., 1923) in 21 cases of chronic non-suppurative arthritis, rheumatoid arthritis or chronic osteoarthritis, with excellent results. Twelve cases were cured and 7 still under treatment, already markedly improved. The initial dose is 0.25 minim (0.015 c.c.) in 1 c.c. of salt solution or sterile water, injected

subcutaneously. The injections are repeated every 3 or 4 days and later every 5 or 6 days, the dosage being increased only gradually, as the patients are very sensitive to the vaccine. The largest dose given in any case was 10 minims (0.6 c.c.).

An activated colloidal sulphur preparation known as "338," containing about 20 mgm. of sulphur to 1 c.c. of solution, was used with benefit in acute polyarthritis, arthritis deformans and septicemias by W. J. Monaghan and F. Garai (Med. Jour. and Rec., July 2 and 16, 1924). In over 600 injections no serious reaction was observed. The dose is 2.5 to 4 c.c. of the solution, given intravenously, usually every day in acute cases and thrice weekly in the chronic. In several illustrative cases of chronic joint disease described, marked improvement in the pain and disability occurred. Septicemias are stated to have cleared up after 4 to 6 injections.

According to H. N. Ghosh (Calcutta Med. Jour., Mar., 1924), caseinyatren solution is of value as a non-specific protein stimulant in gonorrheal, rheumatoid or rheumatic arthritis and the like conditions. The initial dose is 0.5 to 1 c.c. of a 2 per cent. casein in 3 per cent. yatren solution, usually intramuscularly or subcutaneously. The dosage is adjusted to produce a moderate focal reaction by varying the percentage of casein. Absence of reaction indicates increase of strength by 0.5 per cent. until the reaction is obtained, after which a diminution by the same percentage is made. The injections are given at 5- or 6- day intervals. Seven out of 9 gonorrheal cases were cured and the rheumatoid arthritis cases showed striking benefit.

Synovectomy is recommended by P. P. Swett (Jour. of Bone and

Joint Surg., Oct., 1924) in selected cases of chronic infectious arthritis. The indications do not include hypertrophic or atrophic arthritis, but the chronic polyarticular disease with progressive inflammatory changes beginning in the soft tissues and affecting the cartilage and bone, if at all, only secondarily, from disuse. The X-ray shows effusion, capsular thickening and exudate, with calcification of the mushed-out edges of cartilage, followed by ankylosis through capsular fibrosis and fusion of the cartilage-denuded bone ends. The general treatment is similar to that outlined by Pemberton. The local measures are: Partial rest during the acute stage, followed by increasing active exercises, baking and massage. Synovectomy is applicable where there is delayed resolution of the synovial exudate, and should preferably be done before bone and cartilage changes occur, in the hope of preventing such changes. joint is opened at the site of greatest effusion and capsular thickening. Scissors and forceps are next used to dissect out all of the diseased inner layers of the synovia down to healthy tissue. The joint is then dried and closed in layers without drainage.

The intestinal factor in arthritis is emphasized by L. T. Swain (*Ibid.*, July, 1924). In hypertrophic arthritis there is often a large, flaccid, distended intestine, with faulty posture, correction of which relieves the sagging viscera. The bowel atony is frequently overcome by **support** and **exercise**. In the atrophic type there is often a loose, floppy cecum, frequently dilated, causing an incompetent valve and often colitis. Constant clearing out with **enemas**, periodic doses of

castor oil and daily cecal massage are necessary to prevent absorption. These cases also show highly acid secretions, and Wilde's thermal bath treatment is certainly of value in some cases. A diet of fruits, fresh green vegetables and whole grain, with lime water, seems to benefit.

In early rheumatoid arthritis removal of the focus of origin is sufficient, according to S. G. Billington and S. Crabbe (Brit. Med. Jour., June 21, 1924). The dental focus is commonest. Except in root-filled or extensively filled teeth the X-ray is reliable. Cases secondary to thickening of the periodontal membrane have, however, been seen. In the 2d stage of the disease, with definite arthritic changes, the systemic bacterial toxins must, in addition, be neutralized. Among the drugs asserted to benefit are guaiacol carbonate, iodides, collosol manganese, and alternating collosol iodine and collosol sulphur. Foreign proteins, in general, benefit only when severe febrile reactions are produced. The writers prefer autogenous vaccineseither the autohemovacccines or vaccines prepared with bacteria grown from the blood in ammonium carbonate or citrated glucose broth. With these should be combined electrical procedures, viz., the 1000 c.p. lamp for surface vasodilatation, and diathermy and the static brush effluve for deep hyperemia. High frequency, applied either with the vacuum tube or a cotton glove while massaging, is also of value. galvanic current is combined with massage and exercise in ankylosis and contractures.

Colon bacillus vaccine is given intravenously in rheumatoid arthritis by

R. J. Perkins and G. B. White (Brit. Med. Jour., Mar. 10, 1923). The initial dose is as large as possible-50 to 200 millions-and the patient stays in a hospital 1 day for the purpose. The temperature rises in a few hours to 100 to 103° F., often with a chill and sometimes vomiting. Any improvement resulting is usually seen within 2 days. H. Laurie (Med. Jour. of Austral., Mar., 1923) has given 426 injections of the same vaccine, with but 1 alarming reaction (cyanosis and dyspnea). Of 11 subacute cases of rheumatoid arthritis 8 cleared up entirely, while 15 chronic cases were improved as regards pain, stiffness and range of movement.

## C. ARTHRITIS DEFORMANS.

-Senile deforming arthritis of the hip-joint frequently escapes detection, as noted by Jansen (Ugeskr. f. Laeger, July 17, 1924), the pain being often most marked in the knee or sciatic distribution. To detect the hip involvement, he has the patient complaining of pain in the leg cross the latter over the opposite thigh, when the hip pain becomes manifest if hip disturbance exists. Before the age of 40, traumatism or exposure are likely to be causal factors, whereas after 40 the age accounts for the condition. Calot (Bull. de l'Acad. de méd., Feb. 19, 1924) asserts that many cases of so-called arthritis deformans of the hip-joint are merely overlooked congenital lesions. Thorough X-ray examination is desirable.

According to J. Novak (Zent. f. Gyn., Oct. 11, 1924), ovarian insufficiency is an important cause of arthritis deformans. Joint disturbances have frequently been noted at the menopause. In a case he reports, enlargement and severe pain developed in a number of joints in a case of cancer of the cervix successfully treated

with radium. Upon grafting an ovary under the fascia of the rectus muscle the pain was relieved for several months.

TREATMENT.—Marked improvement in all cases was observed by H. Hayn (Deut. med. Woch., May 25, 1923) following intramuscular injections of an emulsion of purified sulphur, 1 part, and eucalyptol, 20 parts, in 80 to 100 parts of olive oil. The injections were given at intervals of 5 or 6 days, in series of 10 or more. Each injection produces a reaction beginning in about 12 hours, with chill, headache, fever and joint pains, subsiding in 24 to 48 hours. The treatment is recommended in all cases of chronic joint disease refractory to salicylates or antisyphilitic treatment. Other measures used included hot air, massage and passive movements.

H. A. Reimann and G. W. Pucher (Amer. Jour. Med. Sci., July, 1924) also report on the sulphur treatment, but not so favorably. Of 17 cases, 4 were markedly and 4 slightly improved. The preparation used consisted of flowers of sulphur, 7 mgm., dissolved in 1 c.c. olive oil (free of fatty acid) and sterilized at 150° C. for 2 hours. This was injected intramuscularly in the gluteal region at 5 to 7 day intervals, increasing the amount each time by 1 c.c. up to 7 or 8 doses. The severity of the reaction varied greatly. The good results were obtained only in cases without gross bony obstruction to joint motion.

D. TUBERCULOUS ARTHRITIS.—DIAGNOSIS.—In early cases of suspected joint tuberculosis in which a positive diagnosis cannot be made by ordinary methods, A.

De F. Smith (Jour. Amer. Med. Assoc., Nov. 15, 1924) performs an exploratory operation. He deems the idea that it is safer to treat conservatively at first and await developments a fallacious one, because once immobilization is started the condition is obscured indefinitely. Of 25 joints explored, 18 involved the knee, 4 the hip, 2 the tarsus and 1 the ankle. Tuberculosis was found in 18 cases. Primary union followed in each case. In the case of the knee, a fairly long incision to the inner side of the patella was made for inspection of the joint and removal of small pieces of tissue for examination. Investigation of the Pirquet test, subcutaneous tuberculin test, blood count, guinea-pig inoculation and X-ray examination showed the only reliable test to be guinea-pig inoculation, and this is inconclusive when negative. The mistake of calling a nontuberculous condition tuberculosis probably is as frequent as the reverse.

TREATMENT.—Discussing indications for X-ray treatment in tuberculosis of the joints and bones, O. H. Petersen and J. Hellmann (Deut. Zeit. f. Chir., May, 1924) point out its relative advantage as regards the return of joint function, whereas surgical treatment has the advantage of a less consumption of time. The rays fail, as a rule, where the power of the body to react against the disease is no longer sufficient or its resisting power is weakened by age. Where they do fail, in old patients more radical procedures are advisable, but in the young, open air treatment, sunlight, feeding up, arsenic, etc., are still available. The best results from the X-ray were obtained in tuberculosis of the wrist and the ankle-joint, the latter especially in old subjects with complicating sinuses. In knee cases, the younger patients reacted the best. In hip cases, the X-ray was used with moderately good results where sinuses existed.

Heliotherapy can be effectively applied in the home, according to A. O'Reilly (Jour. Mo. State Med. Assoc., Feb., 1924), but the technic is rather exacting and must be closely followed. The exposures are begun as soon as the weather permits in the early spring, and are given daily until the cold days of fall, except in bad weather. The several segments of the body are exposed in succession, the time being increased 5 minutes daily until all of the body except the head is treated and the total exposure reaches 2 to 3 hours twice a day. The exposures are given in the early morning and late afternoon. Overexposure is indicated by headache and fever. The head and eyes should be protected. Exposure through closed windows is inadvisable, the glass cutting off some of the violet rays. Sinuses are exposed last. Immobilization should be kept up throughout.

E. SEPTIC ARTHRITIS.—In 3 cases of *influenzal arthritis* of the knee in children, reported by D. Nabarro and J. F. H. Stallman (Lancet, Oct. 11, 1924), thick creamy pus was obtained by puncture in 2 cases and thin greenish pus in the 3d. Several plans of treatment were followed, the best of which appeared to be aspiration or arthrotomy; in the latter event, the joint is washed out with 2 per cent. chloramine in saline solution, then closed. If these fail, drainage is indicated.

TREATMENT.—Weight extension should be applied, as advised by D. B. Phemister (Ann. of Surg., Oct., 1924), during the active period of pyogenic arthritis to lessen the amount of invasion and destruction of articular surfaces at the points of contact and pressure. In tuberculous arthritis extension is not indicated unless articular cartilage has already been destroyed, when it should lessen the tendency to erosion or invasion at the points of greatest pressure.

Among 6 cases of gonorrheal arthritis treated by combined arthrotomy and serotherapy by Pigeon, Bernard and Rouvillois (Bull. Soc. nat. de chir., Apr. 5, 1924), good functional results were obtained in all but 1 case, in which periarthritis and syphilis were superadded. Direct application of the serum to the synovial membrane is advised; for this purpose simple puncture is frequently insufficient, on account of adhesions and fibrinous deposits partitioning off portions of the joint. Arthrotomy is especially indicated in pronounced effusion and distention, though even in a wrist case with slight effusion it gave unexpectedly good results. Primary suture of the wound is advised, except in frankly purulent cases, in which the wound should be left open and Willems's immediate active mobilization method instituted. Likewise in the closed cases, early active motion is preferable to passive motion.

Successful treatment of gonorrheal arthritis by intra-articular injections of gonococcus vaccine is reported by Lombard, Béguet and Goinard (Bull. Soc. nat. de chir., July 5, 1924). In 1 case injections of 0.25 to 1 c.c. of vaccine were carried out at 2-day intervals after evacuation of the joint

effusion by puncture. Complete recovery took place in a month. In another case, of 2 years' standing, in which vaccine subcutaneously had failed, 0.25 c.c. of vaccine, injected into the joint after almost complete evacuation, was followed by a severe local and general reaction and restoration of the joint to normal. The treatment is based on recent studies showing that immunity is a local as well as a general property.

A case of puriform typhoid arthritis of the knee developing 8 years after typhoid fever is reported by Dufour and Baruk (Bull. Soc. méd. des hôp. de Paris, Oct. 17, 1924). Complete recovery followed 4 injections of antityphoid vaccine, 1 of 0.5 and 3 of 1 c.c. at intervals of 2 or 3 days.

## ARTIFICIAL RESPIRATION.

The advantages of the Schäfer prone pressure are stressed by F. W. Pinneo (Jour. Med. Soc. of N. J., Oct., 1924). It is the least laborious to the operator and the risk of damage by overexertion is small. It was found to yield an air exchange of 6760 c.c. per minute, as against the natural 5850 c.c. and the 2280, 4030 and 3300 c.c. afforded by 3 other methods. All machines for artificial respiration should be discarded.

A new procedure, asserted to be superior to all others by reason of the greater airintake, has been described by E. Seaborn (Lancet, July 19, 1924). A man stands on each side of the patient, with palms held upward; each grasps very firmly with both hands the anterior axillary folds. The upper hand passes deeply into the axilla and takes a broad hold of the pectoral The other hand grasps the muscles. anterior axillary fold as low on the chest as possible. Traction is then applied in both an upward and outward direction until the thorax is lifted from the table and its lower part is fully expanded. A long blast of air is heard to whistle through the larynx for several seconds; only on its completion is the traction discontinued. In this method both the upper and lower thorax are expanded, the diaphragm being pulled out flat by the lateral traction. To aid expiration pressure is applied through

the operator's hands to the chest-wall, but the grasp on the axillary folds need not, during this movement, be relaxed. If necessary the procedure can be carried out by 1 man standing at the patient's head, but is not then as efficient, as the outward pull cannot be made as forcible. Tests showed a flow of air in the lungs of 200 c.c. with each movement.

ASCARIASIS.—That ascaris infestation may be readily demonstrable with the X-rays is pointed out by H. R. Schinz (Deut. Zeit. f. Chir., Mar., 1924). In a case with obscure abdominal symptoms, a worm-like filling defect in 2 loops of the jejunum was observed. Later, as the barium-meal moved down, curved filling defects were seen in successive portions of the jejunum and ileum. Santonin and oil of chenopodium were followed by the passage of ascaris ova and 2 worms. The conclusion was reached that the worms moved down with the barium meal. O. Fritz (Fort. a. d. Geb. d. Röntg., Mar., 1924) similarly reports a case examined with the X-rays on account of suspected gastric ulcer, in which ascarids appeared as filling defects in the form of a question mark and an ellipse, with subsequent passage of 2 worms after taking santonin.

ASCITES.—Little has appeared on this subject of late. According to J. W. D. Megaw and G. C. Maitra (Indian Med. Gaz., May, 1924), a form of ascites common in India, assumed to be due to cirrhosis of the liver, is actually the result of a chronic dysenteric peritonitis, fibrosis of the peritoneum having been produced through irritation by the toxins of the dysentery bacilli. Usually there is a history of dysen-

tery or severe diarrhea within a few weeks before the onset, and frequently agglutination in high dilution against the Flexner group of organisms is found. The treatment consists of giving saline laxatives to expel the toxins from the bowel, and is not very effective at best. Paracentesis is to be avoided where possible, as rapid refilling occurs, with resulting increase of tissue starvation.

TREATMENT.—F. P. (Intern. Clin., 1, 88, 1924) notes that omentopexy has been successful in various forms of chronic ascites, including non-alcoholic hepatic cirrhosis, some alcoholic cases, and some cases with a positive Wassermann in which antisyphilitic treatment was also used. The sooner it is performed when indicated, the better the prospects. Usually repeated tapping is further required after operation. Omentopexy is inadvisable in the extremely feeble and cachectic.

ASPHYXIA. —Crile, Rowland and Wallace (Amer. Jour. of Physiol., Oct., 1923) found that asphyxia causes an increased output of epinephrin, manifested by an increase in the temperature of the brain. McCarrison (Indian Jour. Med. Res., Jan., 1924) quotes Cannon and others to the same effect, and also Stewart and his co-workers, to the effect that asphyxia favors the action of epinephrin so that its effects are produced without change in the amount of epinephrin in the blood. His own observations support both of these views, with variations according to the stage of asphyxiation existing at the time. Tournade and Chabrol (C. r. Soc. de biol., Oct. 24, 1924) assert that the vascular contraction occurring in asphyxia is caused by a substance from the adrenals identical with epinephrin.

In open pneumothorax, e.g., in incision of the pleura for evacuation of pus, direct admission of oxygen under slight pressure into the pleural cavity may be life-saving where asphyxial symptoms attend the procedure, according to De Ruddere (Arch. méd. belges, Nov., 1923). Experiments in rabbits had already shown the efficacy of this procedure, which was applied successfully in the author's case. In cases already cyanotic before operation, preliminary intranasal or intratracheal introduction of oxygen, with or without a general anesthetic, may be advantageous.

[See also Newborn, Disorders of: Asphyxia.]

ASTHMA.—SYMPTOMS AND DIAGNOSIS.—That occult gastrointestinal bleeding is sometimes an accompaniment of asthmatic attacks is pointed out by W. Lintz (Boston Med. and Surg. Jour., June 5, 1924), who, in explanation, quotes Manwaring and his coworkers to the effect that increased capillary permeability is an important physiologic change in protein sensitization. Out of 44 cases in which the stomach contents were examined 18 showed blood, while out of 25 examinations of feces 10 were positive. Gastrointestinal disturbance being a frequent symptom of human allergy, it is well to remember that blood in the stomach contents or feces does not necessarily imply an organic lesion, such as ulcer.

The close relationship of Besnier's diathetic prurigo to the anaphylactic state existing in many cases of asthma is emphasized by K. Baagöe (Ugeskr. f. Laeger, Aug. 14, 1924). This skin condition is characterized by severe itching on the flexor surfaces of the joints. The writer found it 13 times among 67 cases of asthma below 20 years of age, usually with a history of recurrent eczema of the face, scalp and other areas in the first few months of life, followed at 1 to 7 years by restriction to the flexor surfaces of the elbows and knees. This condition either accompanied attacks of asthma or followed the taking of certain foods. In every case tested the patient was found hypersensitive to pollen, feathers, horse dandruff, egg or other allergens.

Sensitization now being regarded as the most important single cause of bronchial asthma, investigation of the existence and nature of it is, as a rule, an essential diagnostic procedure in this disorder. First of all, however, care should be taken to eliminate such other causes of dyspnea as cardiac or renal disease, hypertension, mediastinal tumor and advanced pneumonokoniosis. Then, to find out to what materials the patient is sensitive, a most careful history and skin tests are required. As noted by R. A. Kern (Ann. of Clin. Med., Sept., 1923), every ramification of the patient's life, activities and surroundings must be gone into, and likewise the family history, since fully 50 per cent. of asthmatics give a positive family history in some form or other, different members being subject, c.g., to hay fever, a food rash, asthma or a drug sensitization. A description of the onset, duration and termination of the attack should be obtained. The more clearly paroxysmal the attack, not induced by cough or exertion, the more likely is the case to be allergic.

Seasonal variation suggests pollen or certain foods, as strawberries. Many non-

sensitive cases are also seasonal, being worse in winter or in early spring and late fall, but it is unsafe to consider a case nonsensitive merely because of such a history. Some patients sensitive to 1 thing or another are troubled only when their bronchial mucosa has been made abnormally permeable by infection. Attacks of housedust or feather asthma are generally nocturnal. House-dust cases often are troubled only in a certain house, or even in a certain room. An observed relation between a certain food and the attacks should be accepted with due caution, since it is a common observation that asthmatic attacks may follow a heavy meal. One should learn to what animal emanations the patient is exposed, and to avoid error he should be required to submit specimens. If antispasmodics, notably adrenalin, fail to relieve an attack, there is little likelihood of uncomplicated allergy. Skin tests are indispensable [see ANAPHYLAXIS, this Volume]. The practitioner should content himself with the cutaneous test. In housedust testing the writer half fills a widemouthed 2-ounce bottle with the dust, adds enough 14 per cent, alcohol to make a thin mud, and allows to stand for 2 days. A drop of the supernatant fluid on a skin cut is used in the test.

Many cases that begin as a seasonal pollen asthma are prolonged into the fall and winter and finally become perennial because of complicating infection. It is, therefore, essential in diagnosis to locate all sites of infection-tonsils, sinuses, teeth, middle ear-as well as bronchial infection. Each case must be studied from every angle.

Close investigation of early attacks is important in the diagnosis, according to P. Schonwald (Northwest Med., May, 1924), as later attacks may be induced by nonspecific factors. A history of eczema in early childhood points to food asthma. Children are often sensitive to rabbit hair. used in upholstering, etc. A valuable diagnostic method consists in having the patient carry a cover-glass treated with glycerin, upon which substances floating in the air inhaled by him will collect.

A not infrequent cause of diagnostic failure, according to W. Lintz (Ann. of Clin. Med., Mar., 1924), is that the test substance was improperly prepared or has deteriorated. The test products of different firms vary greatly in potency. Many of these substances can be easily prepared by extracting with 18 per cent. alcohol. Another cause of failure is performing the skin tests at the wrong time. When the skin test to a suspected substance has proven negative it should be repeated, preferably just before or during an attack. The state of the vegetative nervous system at the time is an important factor in determining an attack, in addition to the allergic substance.

A number of cases, upon careful examination, do not fall into 1 of the groups of pollen, epidermal, food, dust or bacterial sensitization. An outstanding feature in these patients, according to M. A. Ramirez and A. V. St. George (Med. Jour. and Rec., Jan. 16, 1924), is a history of digestive disturbances - irregular diarrheas, periodic constipation, nausea, headaches. vomiting, and sometimes urticaria. Generally examination shows indicanuria and putrefaction in the freshly voided stool (acid stool with excess of Gram-negative organisms). To these cases the writers apply the term endogenous asthma. They may be recognized in that they give a reaction 2 or 3 times more intense than normal when a scratch test with 1:10,000 histamine (C. P., Kahlbaum) solution is carried out. The resulting wheals are 1.5 to 3 cm. in diameter. Two cases responded to therapeutic injections of histamine, but better results were obtained with biweekly peptone injections which, out of 10 cases, improved 8 and cured 2.

Prevention of intestinal stasis is essential, and colonic irrigations and measures tending to a simplification of the intestinal flora are also indicated.

Where protein tests in asthma are negative or treatment based on hypersensitiveness to food or air-borne proteins proves unsatisfactory, W. S. Thomas, L. W. Famulener and M. De M. Touart (Arch. of Int. Med., July, 1924) recommend the diagnostic use of autogenous vaccines in order to elucidate the infectious factor in the disorder. It is necessary to isolate and identify the organisms present in all possible foci of infection: Nasal cavity and sinuses, especially the antrums and ethmoids; infected adenoids; tonsillar crypts; pus, if present; sputum, and feces. Due consideration should also be given to apical dental abscesses, infected endometrium, seminal vesicles, prostate and urinary tract. Stained films of each original material should also be studied. Each test injection is made with a sterile tuberculin syringe and fine needle, and the amount of each vaccine injected is 0.01 c.c. The injections are made in a spiral row. Positive reactions are either early, appearing in 10 to 30 minutes and soon fading, or late, noticeable in 12 hours or less, and at their height on the 2d day. Either of these positive results calls for therapeutic use of the vaccine that caused it. Since vaccines made of ostensibly non-pathogenic germs have often yielded positive skin reactions and given relief when used in treatment, test vaccines should be prepared from all types of organisms recovered from the patient. Of 26 asthmatic cases treated with such vaccines, 53 were either completely relieved or much improved.

ETIOLOGY.—The idea of sensitization, while a great advance in

our conception in the etiology of asthma, cannot, as stated by F. M. Pottenger (Amer. Jour. Med. Sci., Feb., 1924), be considered as the only factor active in the production of paroxysms. There is something in the make-up of the asthmatic which makes him susceptible to the action of proteins, reflex stimulation, climatic change and physical and chemical irritants. The condition of the body cells themselves determines to a marked extent the manner in which they will react to nerve and chemical stimuli. Experimenters have established beyond doubt the interdependence of the sympathetic nerves and calcium ions in the cell on the one hand, and the parasympathetic nerves and potassium ions on the other. Increased parasympathetic action (as expressed in bronchoconstrictor vagus overactivity in asthma) presupposes a relative increase in potassium as compared with calcium ions in the cells. Vagotonia should be conceived of as based not merely on parasympathetic hypersensitiveness but also on disturbed ion balance in the cells, so that the latter react to a morbid extent when the parasympathetic nerves are stimulated. Calcium, an integral part of the cell and necessary to sympathetic nerve action, may therefore be expected to be of value in asthma as well as in other conditions with parasympathetic hyperirritability, such as hay fever, urticaria, serum disease, spastic colon and diarrhea. (See under TREAT-MENT.)

From 50 to 70 per cent. of all asthma cases, according to various observers, give positive skin tests and clinical proof of *sensitization*. According to R. A. Kern (Ann. of Clin.

Med., Sept., 1923), cases developing in childhood and adolescence are practically all allergic. Of those developing under 25 years, 50 per cent. are sensitive; under 35 years, 25 per cent., while of those appearing after 50 years, very few are allergic.

Recent figures place the incidence of food asthma well under 5 per cent. Aside from the positive skin test, there must be clinical proof that exposure to a particular food will cause an attack. Of 125 cases, 22 reacted to 1 or more foods, but in only 5 was there any relation between food and disease, and in only 2 of these did a food cause asthma. The foods most commonly responsible are egg, milk and the cereals; next, shell fish and fruits. Drug allergies usually appear as urticaria or angioneurotic edema, less often as asthma. Among the inhaled allergens those most often to blame are the hair or dandruff of horses and cats and the feathers (goose, chicken) of pillows. Rabbit hair is often used in pillows. Other causes are duck, canary and parrot feathers; dog, guinea-pig and camel (women's hair puffs) hair, and sheep wool. Of hay fever cases, due to pollen, 40 per cent. suffer from asthma. A baker may become sensitive to the proteins of flour, a tailor to wool, an apothecary to powdered drugs, jewel polishers and woodworkers to wood dusts, especially boxwood. Orris root face powders may give trouble. Commonly there is sensitiveness to bedroom dust, at times from feathers or a wool or grass rug. Dust cases are extremely common. In 40 per cent. of 125 cases Kern obtained positive skin tests to the patient's own or a stock dust extract, and in 26 per cent. the etiologic relation was clinically proven. Asthmatics commonly date the onset of their trouble to an acute respiratory infection; the inflamed mucosa, it would seem, offers a portal of entry for the sensitizing dose of a foreign protein.

> Hyperemia and edema are produced by all asthmogenic substances, according to K. Baagöe (Ugeskr. f. Laeger, July 31, 1924), who regards the asthma as a species of urticaria of the bronchial mucosa. In a boy ex

tremely sensitive to egg, accidental inhalation of a little egg powder caused, in succession, edema of the mouth and lips, severe coryza, hoarseness and stridor, and an asthmatic attack. This patient had reacted by nausea and vomiting to the least amount of egg ingested, but had been enabled, by ingestion of gradually increasing amounts of egg powder in capsules, to take up to 5 Gm.; yet the accidental inhalation brought on the severe reaction above described.

W. Lintz (Ann. of Clin. Med., Mar., 1924) observed the case of a fruit and produce dealer in whom merely handling tomatoes and grapefruit produced asthma by inhalation. Other cases showed that *cold* is often a primary factor, like a foreign protein, and not merely a contributory cause of asthma. These are cases in which pollen or a food are known to be causative, yet the asthma returns in cold weather after their withdrawal, in the absence of bronchitis or heart disease. The cold acts so promptly as to preclude bacterial action as an explanation. Urticaria and even subcutaneous hemorrhages may similarly be induced by cold. In 1 case asthma was found due to sensitiveness to mice. Smelling a mouse—without knowing its presence-in a gauze-covered box brought on violent asthma and dermatitis of the exposed parts in 3 minutes; extermination of the rodents-several dead ones being found beneath the bedroom flooring-resulted in freedom from asthma for 3 years, until the patient moved to another house, facing a park.

Asthma and other allergic manifestations in *pharmacists* have been investigated by M. M. Peshkin (Jour. Amer. Med. Assoc. June 7, 1924), who sent a questionnaire to 14 manu-

facturing houses. The commonest cause of asthma in drug workers was found to be ipecac, and next to it podophyllin and pokeroot. The handling of emetine solution and vanilla beans causes urticaria of the forearms and hands. Rhubarb and lycopodium hypersensitiveness is exceptional. One worker was sensitive to inhalation of urease, derived from the jack or soy bean.

Endocrin disturbances are accepted by many as factors predisposing to asthma. T. Drummond (Brit. Med. Jour., Feb. 24, 1923) presents evidence in support of the view that adrenal inadequacy is a cause of it. F. Widal and P. Abrami (Presse méd., May 31, 1924) report 4 cases in which asthma was related to exophthalmic goiter. The attacks were brought on by various factors such as temperature changes, coal dust, and especially, emotions or the menses. Skin tests were all negative. Each case was cured of both the Graves's disease and the asthma by X-ray exposures of the thyroid. In 1 case, before treatment, administration of a small dose of thyroid gland brought on an attack of asthma; after the treatment, it no longer had this effect. L. von Gordon (Schweiz. med. Woch., Dec. 6, 1923) states that some cases of asthma may be due to adrenal disturbances, resulting in hypotonicity of the sympathetic; this condition is relieved by giving adrenalin. With the lowered sympathetic tone may be combined increased irritability of the vagus terminals in the bronchi, due, in turn, to decrease of blood calcium because of parathyroid insufficiency. This latter condition is one of the chief causes of the unsteady vagussympathetic equilibrium underlying asthma.

Appendicitis as a cause of asthma is further discussed by R. A. Gutmann (Presse méd., Jan. 24, 1923), who reports 4 cases in which the attacks disappeared after appendectomy. The asthma in such cases is ascribed to an abnormal irritability of the vagus due to chronic appendiceal disease, this irritability leading to asthmatic seizures when any disturbance of colloidal equilibrium is added. Pressure on the ileocecal region will also bring on an attack. In 1 case attacks had been induced by antipyrin before operation; after the appendectomy antipyrin caused no disturb-

A case of asthma of genital origin in a man of 32 is reported by Strominger and Birman-Bera (Jour. d'urol., June, 1924). Each intercourse was followed in 2 or 3 days by a typical attack persisting for 3 days. Complete recovery followed 5 cauterizations of the inferior turbinate, which are thought to have interrupted a double reflex arc, genitonasal and naso-pulmonary.

A group of cases presenting asthmatic symptoms on account of myocardial insufficiency, independently of the so-called "cardiac asthma" manifested in nocturnal paroxysmal dyspnea, is recognized by M. M. Peshkin (Med. Jour. and Rec., May 21, 1924). The etiology is essentially that of chronic myocarditis with de-These patients are compensation. not suffering from sensitization and are beyond middle life. Too often such cases are given no relief from their asthma on account of failure to appreciate the incipient cardiac impairment. The treatment consists of diet, rest and digitalis. The latter is

effective even when the heart beat is regular. Epinephrin does not relieve the asthmatic symptoms in these cases, and is even contraindicated.

TREATMENT. — Hyposensitization.—In the light of recent findings to the effect that bronchial asthma is due in the majority of cases to some form of hypersensitiveness, removal of the latter assumes an important place in the treatment. In this connection J. A. Clarke, Jr. (Ann. of Clin. Med. Sept., 1923) divides the patients into 3 groups: (1) Those in which all the atopens [substances to which the patient is specifically hypersensitive] are known; (2) those partially diagnosed, in which some atopens causing asthma have been discovered, but one is convinced there are others; (3) those in which neither the history nor the skin tests, etc., have revealed any atopens producing asthma. It is now possible, he states, to make at least a partial diagnosis in over 75 per cent. of cases, and of these, 3/4 should be markedly relieved by elimination of the atopen or by hyposensitization.

Atopens with which the patient does not come in contact may be dismissed with a warning, explaining just where these substances are likely to be found. Elimination of the atopens causing asthma is the method of choice, but frequently is possible only at great inconvenience or economic loss. Hyposensitization is Cooke's word for lessening of hypersensitiveness by giving repeated, gradually increasing doses of the offending atopen. (The word desensitization should be reserved for anaphylaxis). Any extract which will produce a good-sized urticarial wheal in the skin reaction is potent for purposes of hyposensitization.

In treatment, the ideal initial dose is one which will just fail to produce constitutional symptoms, though producing locally an edema of the skin and subcutaneous tissues about 3 cm. in diameter and disappearing in 24 hours. When, in the intradermal test, 0.01 to 0.02 c.c. is used, it is usually quite safe to give as an initial therapeutic dose 0.1 c.c. of the weakest solution that will just give a weak but definite positive reaction. As regards subsequent increase in dosage, a safe rule is 50 per cent. increase at each injection for the earlier injections—say, the first 10 then more conservative increases. If the patient is exposed to and suffering symptoms from the atopen and the first injection gives some relief, it is usually safe to give the next injection when the improvement begins to subside. Otherwise, 5 to 7 days is a safe rule. When relief is complete, repetition of doses will be required only when symptoms reappear; this may be as often as once a week, but more frequently is 1 to 2 months. In a few instances the maximum dosage available without the production of constitutional symptoms does not suffice to give clinical relief; these are unavoidable failures of hyposensitization.

Constitutional reactions from an over-dose may be either immediate or delayed. Severe or dangerous reactions are always the result of carelessness or mistakes. The delayed reaction, beginning gradually within 24 hours, persisting 3 to 7 days, and featured by increased severity of the asthma, occurs with the higher doses and suggests that the maximum dose has been reached. Marked improvement usually follows it, and no more doses are given until the symptoms again increase in severity, when about ¼ or less of the dose causing the reaction is given.

The treatment in undiagnosed cases or in the undiagnosed factors of the partially diagnosed cases consists, as described by Clarke, in elimination of all foci of infection, particularly in the nose and throat. The nasal passages must be made functionally sufficient. A sputum vaccine made from washed sputum should be tried, but must be properly prepared, the important organisms being grown sep-

arately and mixed later. If such a vaccine cannot be procured, a good stock vaccine is preferable. The most useful drug is sodium iodide. Epinephrin for the attack itself is best, and can be injected promptly by the patient himself. Inhalation of smoke of burning stramonium and belladonna is very useful. Benzyl benzoate and acetylsalicylic acid relieve in a few cases. Overeating, particularly of proteins, should be advised against, every effort made to prevent catching cold, and dusty atmospheres avoided.

In a study of 235 cases of proved asthma, excluding the pure pollenoses, G. P. Meyer (Atlantic Med. Jour., Nov., 1923), using both stock dust extracts and extracts of dust from the patient's own environment, found dust atopens a primary asthmogenic factor in 57 per cent. Treatment included hypodermic injections of house-dust extract in doses of 0.1 c.c., increased by 0.1 c.c. weekly up to 1 c.c. This dose was repeated weekly, then at longer intervals as improvement occurred. Stock dust was used if it gave a good reaction, otherwise extract of dust of patient's own environment. Considerable improvement occurred in 62 per cent., slight improvement in 30 per cent., and no change in 8 per cent. Maximum benefit may be delayed several months.

Vallery-Radot (Bull. Soc. méd. des hôp. de Paris, Mar. 23, 1923) finds it simpler to apply repeatedly to the skin—instead of injecting it—minute quantities of the protein to which the patient is susceptible. In a case of severe asthma from horse emanations, skin reactions from horse hair, induced almost daily for 2 months, brought relief.

Calcium.—Intravenous injection of 5 to 10 c.c. (80 to 160 minims) of 5 per cent. calcium chloride solution are recommended in bronchial asthma by F. M. Pottenger (Amer. Jour. Med. Sci., Feb., 1924). The injection should be made slowly, taking 4 to 5 minutes for 10 c.c. Three severe cases are reported in which the measure relieved both the bronchial spasm and the secretion. In 1 case the relief of heart strain, with slowing of the pulse, was almost phenomenal. The number of doses given ranged from 4 to 14, given at intervals of 2 or 3 days at first, later at longer intervals, up to 1 week. None of the injections exceeded 5 c.c., except in the case receiving 14 injections, in which the last 8 or 9 doses were of 10 c.c. each. Petzetakis (Bull. Soc. méd. des hôp. de Paris, Apr. 10, 1924) reports good results from the same measure, administering 0.3 to 1 Gm., or exceptionally 1.5 Gm., of calcium chloride intravenously in a 5 or 10 per cent. solution. One or 2 injections were sufficient to check an acute attack. A course of 7 to 10 injections being then given, the patients had no further attacks for several months. Judging from the oculocardiac reflex, vagal irritability is not decreased by the calcium, the action of which must therefore be exerted at some point other than the vagus.

A deficit of calcium in the blood serum was found in some asthmatics by F. J. Novak, Jr. and A. R. Hollender (Jour. Amer. Med. Assoc., Dec. 15, 1923). Calcium lactate alone by the mouth failed to give relief, but when combined with thyroid extract it gave relief in 48 to 72 hours in 6 out of 12 cases. The dose of the calcium salt was 5 grains (0.3 Gm.)

and of the thyroid, ¼ grain (0.015 Gm.), at first 3 times daily, and later reduced to twice or even once a day. Return of symptoms occurred when the medication was discontinued, but added use of the ultra-violet ray from the mercury vapor quartz lamp appeared to fix permanently the ionic calcium content of the blood serum.

Adrenalin.-In regard to adrenalin as a remedy in the acute attack, Lintz (Ann. of Clin. Med., Mar., 1924) deems it unwise to temporize by giving less than 1 c.c. (16 minims), which amount he finds absolutely safe. During the interval the best remedies are tincture of belladonna and a saturated solution of calcium iodide-the latter given in doses of 1 dram (4 c.c.) 3 times daily after meals. In cases of severe, prolonged asthma, lasting for days and very difficult to check, a foreign protein intravenously will usually succeed, e.g., 4 minims (0.25 c.c.) of typhoid vaccine intravenously, given on 2 successive days.

Where adrenalin fails to relieve an attack, apparently because vagus excitation is such as to prevent the usual effect from stimulation of the sympathetic by the adrenalin, L. von Gordon (Schweiz. med. Woch., Dec. 6, 1923) finds combined use of atropine and adrenalin sometimes effective. The atropine is given first, to pave the way for the action of the adrenalin.

In a case reported by Ross and Rolleston (Brit, Med. Jour., Jan. 7, 1922) asthma followed rapidly upon the production of an artificial menopause by radium. No sensitization could be discovered, and for a year all treatment failed. Ovarian and mammary extracts being then given, the asthma ceased in 3 days, and had not returned 11 months later.

PROTEIN THERAPY.—Analysis of results obtained severally with specific desensitization, autogenous vaccines, milk or peptone in sensitive and in non-sensitive asthmatics led N. S. Schiff (Amer. Jour. Med. Sci., Nov., 1923) to favor non-specific therapy more or less as a routine measure in asthma, even in the sensitive cases, except where removal of the offending protein gives relief. In non-sensitive cases, milk injections relieved a larger percentage (6 out of 8 cases) than did peptone or autogenous vaccine. Milk is the nonspecific agent of choice because of its ready supply and ease of preparation. The writer merely placed whole milk in a 2-ounce, rubbercapped bottle on a water-bath and allowed it to boil for 1 hour. The initial dose was 0.5 c.c. (8 minims), given subcutaneously. This was increased by 0.5 to 1 c.c. at triweekly intervals up to a maximum of 3 c.c. (48 minims). In non-specific protein therapy it is important to avoid anaphylaxis; this is done by testing for sensitiveness in the usual way with the skin test.

Vaccines.—In preparation for the treatment of asthma with autogenous vaccines, W. S. Thomas and M. De M. Touart (Arch. of Int. Med., July, 1924) made cultures in 62 cases from various sources according to the indications in each case—frequently sputum, otherwise material from infected sinuses, the pharynx or the tonsils, excised or in situ, and occasionally, from the stools. Treatment was based on the positive results from the test vaccines, usually 2 or more organisms giving sufficiently active reactions to be used for this purpose. The treatment vaccines were sepa-

rate suspensions of each organism in salt solution, plus 0.25 per cent. tricresol, 1 c.c. containing about 1 billion organisms, except in the case of Streptococcus hemolyticus and the Friedländer bacillus, in which the concentration was halved. The object sought was to produce at frequent intervals a local reaction with slight swelling, tenderness and perhaps erythema, lasting 1 to 5 days. The initial dose was 100 million of each treatment dilution; if this produced the desired reaction it was repeated every 2 or 3 days until no reaction followed, whereupon the dose was increased by 100 million. The dosage seldom exceeded 400 million. With improvement the intervals were increased to 5 and then 7 days. The total number of doses was from 1 to 30, and the average 15. Complete relief or material improvement resulted in 87.1 per cent.

J. Hekman (Nederl. Tijd. v. Gen., Dec. 15, 1923) usually found numerous streptococci in 300 asthmatic sputums and believes asthma usually attended with sensitization originating in bacterial infection of the smaller bronchioles. He reports good results with streptococcic autogenous vaccines prepared from the patient's sputum, even without change of environment. The initial injection is 40 million bacteria, increased gradually to 1/2 or 1 billion, according to reactions. In obstinate cases a turpentine fixation abscess occasionally brings relief. Breathing exercises are useful.

Combined peptone and vaccine treatment is recommended by J. Veitch (Brit. Med. Jour., Jan. 5, 1924), especially in cases that do not respond to either agent alone. Three grades of the mixed solution were used: (A)

5 c.c. of 5 per cent. peptone + 235 million organisms mixed catarrhal vaccine; (B) 5 c.c. of 10 per cent. peptone + 940 million organisms; (C) 10 c.c. of 10 per cent. peptone + 1,880 million organisms. For the first 4 weeks 1/2 tube of A was given weekly; the next 4 weeks, 1/2 tube of B, and so on. The injections were given intramuscularly in the "painless area" just below the anterior superior iliac spine. Of 24 cases, 14 were cured, 4 greatly improved, 5 somewhat improved, and 1 not improved. A fairly sharp reaction usually followed the injections in about 6 to 8 hours. The best results were obtained in the younger patients.

X-rays.—In 40 cases G. Marum (Strahlenth., xvi, 817, 1924) used the X-rays over the region of the hilum anteriorly and posteriorly on both sides, administering not over ½ erythema dose over fields of 80 square centimeters through 3 mm. of aluminium. Thirteen cases were cured, 11 much improved, 8 improved, 5 unchanged, and 3 lost sight of. Usually there was increased expectoration for some days after the exposures. In many instances asthmatic attacks ceased after the 1st treatment.

According to K. Hajós (Zeit. f. d. ges. exp. Med., xxxviii, 229, 1923), the favorable effect of the X-rays in asthma is due to an action on the liver, resulting in the throwing into the circulation of protein substances insufficient in amount to cause anaphylactic shock but sufficient to desensitize the system in asthma due to hypersensitiveness.

Climate.—For asthmatic subjects living in the lowlands and exposed constantly to substances productive of asthma, Van Leeuwen, Varekamp and Bien (Klin. Woch., Mar. 25, 1924) recommend a stay in the mountains, where the air is free of

such substances and a marked bronchitis, if present, may be recovered from. If the results are to be maintained upon return to the lower level, however, hyposensitization should be carried out while the patient is still in the mountains, if not with a known atopen, then with a general antiallergen such as tuberculin.

Surgical Measures.—Among 62 patients operated on for asthma in the nose and throat clinic, C. A. Heatly and S. J. Crowe (Johns Hopk. Hosp. Bull., Dec., 1923) frequently found sinus infections, commonly with polypi or polypoid hypertrophy of the sinus mucous membranes, with little or no free pus. The sinuses most often involved were the ethmoids and antrums. There was pansinusitis in 7 cases. In many cases obstructive deviation of the septum, hypertrophied turbinate membranes, chronic infection of the tonsils or infected adenoids were found, alone or in combination. When operation is indicated in these cases it should be radical and definitely remove the infection; otherwise, benefit is likely to be transient or nil. Bronchitis reduces the operative results. Only 1 patient described himself as "cured" after 3 years; 53 were improved and 9 unimproved. In 14 there was recurrence, sometimes because of return of intranasal pus or polypi. A majority of the cases subjected to asthmogenic tests were non-sensitive; in sensitive cases, specific protein treatment should be given in addition to the operative procedure.

Various nerve resections for asthma have recently been proposed and carried out by German observers. H. Kümmel (Klin. Woch., Oct. 1, 1923), although the bron-

choconstrictor nerve fibers are considered to belong to the vagus, found it possible in 3 cases to exclude and paralyze the bronchoconstrictors by removal of the 3 cervical sympathetic ganglia on the left side, with their deep branches and contained vagus fibers. In these 3 intractable cases of 20 years' standing, the asthmatic attacks ceased at once and had not returned 3 months later. The inspiratory dyspnea is eliminated by the operation. F. W. Kaess (Ibid., May 13, 1924) resected the cervical sympathetic in 5 severe cases; the attacks ceased in all, and had not returned after periods ranging from 3 weeks to 4 months. He regards the sympathetic as a centripetal pathway for asthmogenic stimuli from the periphery, a portion of which stimuli are thus eliminated by removal of the sympathetic on 1 side. P. Jungmann and F. Brüning (Ibid., Mar. 4, 1924) removed the cervical sympathetic, including the stellate ganglion, in 3 severe cases, but the attacks returned after a few days; they do not favor the operation, and assert that it can hardly be expected to reduce the vagotonia which underlies the asthmatic attack. Harttung (Zeit. f. Chir., Oct. 18, 1924) observed gradual cessation of attacks in 2 months after Kümmel's operation in a severe case of 11 years' standing, but the operation was soon followed by distinct muscular atrophy in the left shoulder, arm and chest wall, which, however, appeared to be correcting itself slowly some months later.

Kappis (Med. Klin., Sept. 28, 1924) reports having performed resection of the right vagus below the recurrent laryngeal nerve in a number of cases, most of which recovered or improved, though 2 patients developed recurrent laryngeal paralysis and 1 died of accidental rupture of the subclavian artery.

Frey (Münch, med. Woch., May 9, 1924) asserts that while the results from sympathetic and vagus operations in asthma have been favorable, a normal heart is a prerequisite to their performance, experiments showing that in injured hearts such disturbance of the regulatory nerve-supply of the organ has serious effects on its function. He also noted that after such operations digitalis and strophanthin act much less strongly on the heart than before.

Bronchoscopic Treatment.—This method has been used by W. F. Moore and R. M. Lukens (Atlantic Med. Jour., Sept., 1924) in 16 cases in Chevalier Jackson's clinic. autogenous vaccine is made from material obtained at the 1st bronchoscopy; then a medicated solution is instilled into the right and left main stem bronchi in succession. solution usually consists of: Adrenalin (1:1000), 20 drops; cocaine (10 per cent.), 10 drops; normal saline solution, 1 dram (4 c.c.). Any thick, clinging mucus is removed by suction or swabbing before the instillation. Three treatments are given at weekly intervals, then at longer intervals on recurrence of asthma. Passive congestion of the mucosa has generally disappeared by the 3d treatment. Eight cases showed marked improvement.

ATHREPSIA. -The factor of food deficiency in athrepsia is particularly dealt with by Mouriquand, Michel, Bertoye and Bernheim (Presse méd., Sept. 24, 1924). A feature of the condition is that, once established, it generally ends fatally even though its original cause may have disappeared. The writers were able to produce in guinea-pigs a similar state by means of a diet deficient in vitamin C. Of the younger animals the majority went into a progressive cachexia in spite of restoration of a normal diet after 24 to 28 days. The pathologic changes found concerned chiefly the liver, bone marrow, spleen and adrenals. Vitamin C deficiency is possibly a factor in some cases of human athrepsia.

P. Rohmer (Bull. Soc. de péd. de Paris, Jan., 1924) recognizes an

acute as well as a chronic form of athrepsia. The former corresponds to Finkelstein's "decomposition" and is featured by diarrhea with rapid, continuous loss of weight, loss of the body water being followed by loss of mineral substances and nitrogen, with ultimate destruction of the Under these conditions he recommends feeding with skimmed breast milk in quantities twice those usually taken of normal breast milk; the fat is removed because it aggravates the diarrhea and involves a harmful loss of fluid and alkali. Gratifying results followed this treatment. A return to the normal breast milk can generally be made in the beginning of the 2d week. In chronic athrepsia, over-feeding is indicated and may be begun at once even in grave cases unless an acute attack has just occurred. quently 200 calories or more per kilo, of body weight are required. The food given is that which is best borne in the individual case, with due consideration of previous conditions and the state of the intestines.

Attention is likewise drawn to the large food requirements of malnourished infants by W. McK. Marriott (Jour. Amer. Med. Assoc., Aug. 23, 1924). If the infant weighs 1/2 of what he should for his age, the total food-requirement is likely to be about 100 calories per pound (220 per kilo.) and the milk requirement about 3 ounces per pound. The food value of the breast milk may often be increased to advantage by addition of corn syrup or of dried milk, e.g., to 1 ounce of breast milk may be added 1/2 ounce of syrup and 1/3 ounce of dried milk. Cow's milk, acidified with lactic acid and enriched with

corn syrup, is also readily digested, e.g., 22 ounces of whole lactic acid milk with  $1\frac{1}{2}$  to  $2\frac{1}{2}$  ounces of syrup. In infants who fail to gain even on these mixtures, the writer strongly recommends repeated transfusions of matched citrated blood-about 1 ounce for each 3 pounds of body weight. Often the infant will then begin to gain, without any change in the feeding. Another measure is glucose intravenously, given slowly in a 20 per cent. solution— $\frac{1}{3}$  to  $\frac{1}{2}$ ounce per pound of body weight. Glucose thus given is only partly utilized; but if insulin is given at the same time, there is better utilization, and a gain in weight results. A 20 per cent. glucose solution containing 15 units of insulin per 100 c.c. has enough glucose to "buffer" completely the insulin-an essential feature if serious consequences are to be avoided, as malnourished infants often have a low blood sugar. A gain in weight almost invariably occurs, even in infants with infec-The gain is not later lost when the injections are discontinued. This measure is reserved for the extreme cases of malnutrition or athrepsia, and may be used daily.

ATROPHY, INFANTILE.

From a review of evidence and his own results, L. G. Parsons (Lancet, Apr. 19, 1924) believes it demonstrated that infantile atrophy is not a gastrointestinal, but a metabolic disorder, essentially due to starvation. Studies of the marasmic condition of infants with pyloric stenosis, obviously due to partial starvation, show that it is identical with that of infantile atrophy. The initial causes of the latter may be: (1) In-

sufficient food; (2) unsuitable food; (3) diarrhea and vomiting; (4) infection, e.g., pyelitis or pneumonia; (5) poor hygienic surroundings; (6) prenatal influences and constitutional causes. Weight is lost at the expense of the metabolically inactive tissues and water until the child is 20 per cent. below weight. It then becomes an atrophic infant, unable to utilize its food properly. The basal metabolism is increased and continues to increase with increasing emaciation; hence high caloric feeding is essential. Absorption from the intestine-except under certain conditions, such as diarrhea and some forms of fat, carbohydrate and protein indigestion—is essentially normal.

Experimental findings on vitamin A deficiency which may prove of importance in infantile atrophy have recently been published. The presence of 2 substances in certain food fats has been shown, viz., fat-soluble A and a substance which regulates calcium metabolism. Butter-fat is a better source of the fat-soluble A than of the other substance, while codliver oil is a good source of both.

Many atrophic children can absorb calcium as well as normal children. Experiments indicate that in atrophy an ample intake of fat and calcium produces only beneficial results.

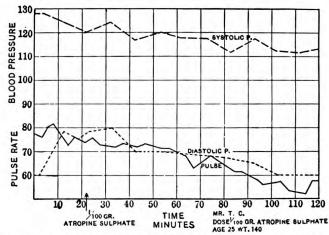
Many cases of atrophy develop without any gastrointestinal disturbance. In the absence of diarrhea, the digestion and absorption of carbohydrates appear to be normal. Carbohydrate indigestion from sugar fermentation does, however, occur, the stools then becoming acid, loose and green, with vomiting, colic and sore buttocks. If the indigestion continues, diarrhea is likely to oc-

cur, and then fat absorption is diminished, with further wasting as a result. The treatment consists of limitation of carbohydrate intake and substitution of a less fermentable sugar, vis., dextrimaltose. For this purpose, proprietary foods should be replaced by a cow's milk mixture.

Stress is laid on the poor supply of HCl in the stomach in many cases of infantile atrophy. The buffer (alkali) value of the foods given thus becomes of importance, for if gastric acidity fails to reach a certain level, gastric digestion cannot take place. The buffer value of cow's milk being to that of breast milk as 3.3 is to 1.3, addition of acid to it is advisable in these cases, otherwise more digestion will be

sible, otherwise curdling may occur on account of lactic acid already present in it. This method proved valuable in children at least 3 months old who were not progressing on ordinary cow's milk mixture. Citric acid may be more easily obtainable than decinormal HCl and may be substituted for it in the amount of ½ grain (0.03 Gm.) to the ounce of milk.

ATROPINE.—PHYSIOLOGICAL ACTION.—R. D. Rudolf and F. M. R. Bulmer (Amer. Jour. Med. Sci., Nov., 1924), in numerous clinical tests with small doses of atropine, found that single doses of ½100 grain (0.0006 Gm.) given hypodermically or by mouth nearly always cause a distinct reduction in the pulse-rate, continuing for many hours—often all day after a dose given at 8 A.M. In 3-day tests in

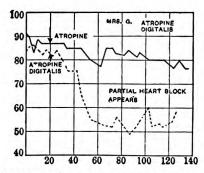


Slowing of pulse-rate and lowering of blood-pressure after  $^{1}/_{100}$  grain of atropine sulphate. (Rudolf and Bulmer, in Amer. Jour. Med. Sci.)

carried out in the small intestine than normal and bacterial invasion of the duodenum will be more likely on account of the reduction or absence of HCl. Good results follow the addition to every ounce of milk of 2 drams (8 c.c.) of decinormal hydrochloric acid and 2 drams of water. The milk should be as fresh as pos-

which a single such dose was given only on the 2d day in some 50 individuals, the average pulse-rates for the 3 days were 80.22, 75.5 and 80.45. In the few instances in which there was little or no slowing or even a slight hastening, further reduction of dosage nearly always resulted in a slowed heart, these subjects being evidently more susceptible to the drug than the others. A larger dose—1/50 grain (0.0012 Gm.)—caused a preliminary brief slowing

followed by a considerable rise (up to 100 per minute) lasting 4 hours, succeeded, in turn, by a slowing (to about 60) which continued the rest of the day. In subjects placed on 1 dram (4 c.c.) of digitalis tincture for a week, with the heart only very slightly slowed, a single dose of ½100 grain of atropine caused a great exaggeration of the slowing, sometimes down to 40 per minute, and in 1 instance some degree of



Digitalis and atropine. Upper tracing shows effect of atropine alone; lower tracing, of atropine after a week of digitalis in the same individual. (Rudolf and Bulmer.)

heart-block. Furthermore, in a case of partial heart-block of long standing, 1/50 grain of atropine first increased the block by (central) vagal activity, then decreased the block as the vagal endings became paralyzed. In the same patient, 1/200 grain of atropine by mouth thrice daily markedly increased the block, and exercise now did not remove it. Evidently, if atropine is to be given in partial heart-block the dose must be large or the block will be increased. In a few cases of Graves's disease, small doses of atropine seemed to slow the heart-rate. In auricular fibrillation, paradoxically, small doses of atropine usually hastened the ventricular rate (probably through reduction of the refractory period).

From studies of the effects of atropine on the gastric functions, B. C. Lockwood and H. G. Chamberlin (Arch. of Int. Med., Dec. 1922) concluded that the secretory and motor depression it produces in the human stomach is much less than occurs

in lower animals. In maximal clinical dosage it depresses both the free and total gastric acidity about 30 per cent. and delays evacuation of an Ewald meal about 10 minutes. M. Löwy and O. Tezner (Monats. f. Kinderh., July, 1923), in X-ray studies in children, found evacuation always retarded by 0.002 Gm. (1/32 grain) of atropine. Loeper and Marchal (Prog. méd., May 17, 1924), giving a test meal of 125 c.c. of peptone water and 0.25 mgm. (1/260 grain) of atropine, found that the latter greatly increases leukopedesis, and believe that in gastric ulcer this increased ingress of leukocytes is as useful in healing the ulcer as the reduction of secretion is in checking the motor spasms and pain. In this connection the drug acts more strongly and rapidly when taken by mouth than when injected.

THERAPEUTICS.—According to H. D. O'Sullivan (Brit. Med. Jour., Jan. 6, 1923), atropine is of value in migraine. He gives it for 3 weeks or more to begin with, then in courses of 10 to 14 days at intervals, according to indications. The dosage is 1 to 3 minims (0.06 to 0.2 c.c.) of a 1 per cent. solution of the sulphate 3 times daily after meals.

Atropine is recommended as an intestinal relaxant in spastic constipation by C. D. Aaron (Amer. Jour. Med. Sci., June, 1923). Often ½ grain (0.008 Gm.) of belladonna extract t.i.d. suffices, but in some cases atropine in full doses is required. As a less toxic preparation, atropine methylnitrate (eumydrin), ½0 grain (0.001 Gm.) 2 or 3 times daily, may be given.

In tabetic optic nerve atrophy C. Abadie (Presse méd., Apr. 19, 1924) finds atropine always beneficial when injected into the back of the orbit in 1-mgm. (1/65-grain) amounts. This measure is also diagnostically valuable to ascertain whether an optic atrophy is due to vascular spasm or to actual disease of the optic disk. If the former cause exists, vision improves, and the visual field enlarges within 1/2 hour after the injection.

B

BABINSKI'S REFLEX. - Modifications of the Babinski reflex under various conditions are described by F. M. R. Walshe (Brain, Oct., 1923). In the presence of hypertonus of the limb extensors (spasticity), the dorsiflexor component, on account of an extensor rebound, becomes the salient and sometimes the only visible feature of the reflex. Furthermore, the sudden tension in the calf muscles resulting from the active dorsiflexion of the foot may set up a clonus, visible chiefly when the rebound is established and the foot and toe are in active plantar flexion. Thirdly, a transient plantar flexion may precede the dorsiflexion. Under the influence of Magnus and DeKleijn's tonic neck reflex, there is an incomplete reflex reversal of the Babinski resulting in diminished amplitude and duration of the latter. The Babinski may be diminished or even abolished in hemiplegia by rotation of the head to the paralyzed side of the body. Head rotation to the opposite side is worth trying in attempting to elicit the Babinski in all cases in which there is a dubious sort of plantar response.

## BACILLUS ACIDOPHILUS.—

Further experiences with this organism have confirmed its utility in certain intestinal disorders. Cheplin, Fulmer and Barney (Jour. Amer. Med. Assoc., June 30. 1923) state that in the constipation group, the feces are noticeably changed, becoming yellow, soft, comparatively odorless and resembling the infantile stool, with elimination of pain in straining at stool. In the diarrhea and mucous colitis group it leads gradually to the production of soft, light, partially formed stools, with complete disappearance of mucus. There is also marked clinical improvement through relief of preexisting toxic symptoms. G. F. Reddish and E. C. L. Miller (Va. Med. Mthly., Jan., 1923), reporting uniform success with young milk cultures of the germ, note that while development of the aciduric organisms already present in the bowel may be encouraged by ingestion of lactose or dextrin, living cultures of B. acidophilus in milk or broth, taken in rather large

amounts, will act more rapidly and with less discomfort.

According to C. C. Bass and W. E. Jones (New Orl. Med. and Surg. Jour., Sept., 1923), for best results acidophilus milk should be taken with the meals, preferably a glass with each meal, in order to inoculate the food heavily with viable bacilli. The daily amount required is 1 pint to 1 quart. With this procedure marked bacterial transformation of the feces is effected in 4 to 10 days, with decrease or even practical disappearance of all other bacteria, which result is generally maintained as long as the acidophilus milk is continued.

The effects of acidophilus milk were clinically tested by G. C. Mizell (So. Med. Jour., Nov., 1923) in cases of long-standing intestinal disturbance, for the most part already subjected to operations and suffering from complications such as chronic gastritis, dilated stomach or achylia gastrica. In 1 group of cases, with toxemia and stasis, headache, aching limbs, despondency, abdominal pain and soreness, gas, nausea and vomiting, the acidophilus milk resulted in relief of stasis, symptoms and indicanuria in 40 per cent., of stasis and symptoms alone in 10 per cent., and of stasis alone in 10 per cent., the remaining 40 per cent. being unrelieved. In a 2d group, with stasis and colitis, abdominal pain, soreness and gas, but no putrefactive toxemia, stasis and symptoms were relieved in 60 per cent., stasis relieved and symptoms improved in 10 per cent., and symptoms alone improved in 10 per cent., with failure in 20 per cent. Improvement in body weight, strength and blood quality occurred wherever the stasis and toxic symptoms were relieved.

In 30 cases of constipation, N. Kopeloff (Arch. of Int. Med., Jan., 1924) used acidophilus milk with good results. In all but 2 cases the number of defecations was increased. The dosage cannot be standardized. In severe cases, as much as 1500 c.c. of the milk may be required; with this 400 Gm. of lactose may with advantage be given daily. High enemas of warm acidophilus milk are also effective. Benefit usually persisted a long time after cessa-

tion of treatment; in some cases it was observed to be still present 11 months later. When the defecations tended to decrease, continued use of lactose proved beneficial. Transformation of the flora from proteolytic to aciduric may generally be induced by the treatment, and is usually accompanied by almost daily defecations, regardless of the severity of the constipation. The same observer, with P. Beerman (Ibid.), found that filtering or sterilization of acidophilus milk removed its effect in constipation, concluding, therefore, that its action is really due to the living germs contained and not to physical or chemical influences.

According to Cheplin, Post and Wiseman (Boston Med. and Surg. Jour., Sept., 1923), at least 50 billions of viable organisms in milk should be given daily for 6 weeks or longer to effect clinical improvement. Tablets of the bacilli are valueless. C. C. Bass (Jour. Amer. Med. Assoc., May 10, 1924) states that if the apparent therapeutic value of maintaining an acidophilus intestinal flora is confirmed, acidophilus probably should be a part of the diet of healthy It is a pleasant, nutritious persons. beverage equal or superior to almost all other forms of "buttermilk." He describes in detail a method of preparing large quantities of the milk. In New Orleans acidophilus milk thus prepared is now delivered to hospitals and homes at a price similar to that of ordinary milk. Cooling and storing acidophilus milk in a refrigerated room prevents the acidity from increasing but does not hold up the number of acidophilus bacilli any more than at room temperature. The milk can be kept in cold storage for 3 or 4 days without considerable change, but ideally should be used within 1 or 2 days.

BACKACHE.—In many cases of apparent gynecologic backache, according to W. P. Graves (Boston Med. and Surg. Jour., Dec. 27, 1923), gynecologic factors are really absent or doubtful, and the actual cause may be pronated feet, sacroiliac strain, lateral spinal curvature, rigid spine, etc. In marked prolapse, the

greater the descent of the uterus, the less frequent the symptoms of tire and backache, the patients with complete procidentia suffering the least. This observation tends to relegate essential uterine backaches chiefly to cases of retroflexion with little or no prolapse. In the essential uterine backache of young nulliparæ with uncomplicated retroflexion, the source of the pain is probably at times in the uterine wall itself. Essential dysmenorrhea in women with retroflexion is generally felt in the lower back instead of in front. In general prolapse, with diastasis of the recti, the backache is secondary to the general exhaustion following work or long standing; as there is usually no orthopedic error, cure of the backache may be expected from a reconstructive gynecologic operation. Diastasis of the recti is a common and important cause of pain low in the back, but higher than the essential uterine backache. This form yields to approximation of the recti in finishing the operation. If operation is inadvisable, mechanical abdominal support is resorted to. In simple retroversion with low backache, the writer always refers the patient first for orthopedic diagnosis and treatment, and considers gynecologic treatment only if orthopedic diagnosis is negative or orthopedic treatment fails, remembering, however, that after the menopause the atrophied uterus lies normally in 2d degree retroversion, and that such a uterus, if otherwise well supported, cannot be the cause of backache.

In the *psychoneurotic* form of *back-ache*, J. W. Courtney (*Ibid.*) recognizes, in particular, 3 varieties, as follows: (1) A vise-like tightening, throbbing

and burning in the cervical spine, transitory and brought on by anxiety or emotion; or, there may be a more persistent hyperesthesia or dull ache of the spine. (2) A dull, persistent ache in the lower cervical region and across the shoulders, with frequent complaint that the head feels heavy and conscious effort has to be made to keep it upright. (3) An ache in the lumbar spine, due to emotional inhibition of gastrointestinal secretion and peristalsis, with resulting distention and tract on the root of the mesentery. In the treatment, attention should be focussed on increasing the food intake and adjusting the diet to existing secretory conditions. In the 3d variety, a valuable adjunct is giving bacillus acidophilus before meals and a mixture containing sodium bromide, sodium bicarbonate, chloroform water and fresh infusion of rhubarb after meals. Another indication, the prevention of energy leakage, is met by psychotherapy and bromides given with the bitter tonics as vehicles. Addition of a ¼ grain (0.015 Gm.) tablet of extract of cannabis after meals and at bedtime is helpful.

Backache from vertebral anomaly is emphasized by T. A. Willis (Surg., Gyn. and Obst., May, 1924), who found variability of structure in the thoracicolumbar portion of the spinal column in 11.6 per cent. of 850 subjects. He divides the anomalies of clinical importance in low back pains into 2 groups, the 1st and largest including defects of the last presacral vertebra, described as split and neural arches, together with variations in size and form of the transverse processes of the last lumbar segment and its occasional impingement upon or articulation with the ilia. The 2d group includes anomalies of the articular processes between the last lumbar and 1st sacral segments; the usual bony anchorage at this point being lost, the ligaments alone give stability to the spine, and are often not strong enough to withstand the enormous twisting leverage in this region. Diagnosis of these anomalies is ultimately based on the X-ray; but certain clinical features pointing to ligamentous injury are very suggestive, vis., pain aggravated by pressure or movements producing local tension; spasm of the muscles which resist these movements, and limitation of motion. In the bilaterally separate arch there is acute sensitiveness to pressure directly upon the spinous process, which, in longstanding cases, may be moved from side to side by the examiner, causing much pain. As regards treatment, traumatized ligaments require protection from further injury while their recovery is being hastened by active movement within the bounds of protection, careful massage and local heat. Protection usually implies strapping, braces, etc. Rupture of the synchondrosis is more serious, as the cartilage shows no tendency to reunite, and stability depends solely on union of the ligaments. For the impinging transverse process, thorough relaxation in dorsal recumbency followed by postural training and support usually precludes the need of any operative procedure.

In regard to industrial lame back, R. B. Osgood and L. B. Morrison (Boston Med. and Surg. Jour., Aug. 28, 1924) state that skilled interpretation of meticulously taken roentgenograms by roentgenologists and surgeons familiar with the clinical pictures is the most valuable single aid in disproving, suggesting, confirming or establishing the diagnosis made by careful history and physical examination. Ability to estimate the extent to which psychic factors enter is an essential prerequisite.

BACTERIOPHAGIA.—In 1917 d'Herelle, of the Institut Pasteur, Paris, reported an unusual phenomenon in connection with the stools of patients convalescing from dysentery. Filtrates from broth cultures of these stools, when added in small amounts to young broth cultures of the Shiga dysentery bacillus, dissolved the bacilli after a few hours in the incubator, the previously cloudy bacterial suspensions becoming perfectly clear. The

agent having the property of dissolving bacteria is regarded by d'Herelle and others as a living organism which grows at the expense of the bacteria (hence the term "bacteriophage"), though some writers regard it as being simply a ferment, with or without a proferment, produced by the bacteria, intestinal glands or leukocytes. The bacteriophage resembles a living agency in that it can be propagated indefinitely in bacterial subcultures in which it thrives, usually with an increase in its virulence for the bacteria.

Only 1 species of the bacteriophage appears to exist, but this can adapt itself as a parasite to all kinds of bacteria, although more readily to the Gram-negative bacilli than to Gram-positive bacteria such as the pyogenic cocci. It withstands a higher temperature than bacteria—up to 70° C. It is invisible microscopically and passes through the Berkefeld filter. It has been recovered from all human organs, though found chiefly in the alimentary tract. It has also been found in the urine, the blood, effusions, river and sea water, and in the soil, seeming, in fact, practically ubiquitous.

The bacteriolytic power of the bacteriophage may be extremely intense. D' Herelle ascribes to it the occasional observation in Haffkine's laboratory of bouillon cultures of the plague bacillus becoming completely clear in a few hours; for want of a better explanation at the time, the cultures were said to have "committed suicide." He also ascribes to it the fact, noted by Hankin, that it has never been possible to ascribe any case of cholera to ingestion of water from the rivers Jumna and Ganges, in India. In Jumna water filtered and inoculated with cholera germs, these germs disappeared in 4 hours, but when the water was boiled after filtration but before addition of germs, the latter multiplied in it. Hundreds of experiments have convinced d'Herelle that the bacteriophage is a living organism, parasitic to bacteria, but itself presenting all the main characteristics of bacteria, including fixation of the complement in the presence of an antiserum. He terms it Bacteriophagum intestinale. It acts on bacteria through its ferments or lysins. Living, normal bacteria constitute its only culture medium. Experiments and ultra-microscopic examination show, according to d'Herelle, that the bacteriophage passes into the interior of the bacterium, forms a colony of 15 to 25 therein in 1½ hours, whereupon the bacterium bursts, setting free the young bacteriophages.

Any single strain of the bacteriophage is generally antagonistic to several species of bacteria, but with variable virulence. All combinations of bacteriophagic virulence, quantitative as well as qualitative, being possible, no 2 strains of the bacteriophage are identical in their properties. At times bacteria develop power to resist the parasite; at such times the bacteria assume a coccoid appearance, become encapsulated and non-agglutinable, resist phagocytosis, and possess great vitality and heightened virulence for the animal organism. As a normal inhabitant of the intestine, the bacteriophage lives therein at the expense of the saprophytic bacteria, which have an inherited partial resistance to it. When a new bacterial invader enters the bowel, the virulence of the bacteriophage against it becomes heightened and may, in the absence of an acid reaction or of a bacteriophage-resistant property, already acquired by the invader elsewhere, overcome the invader and prevent development of disease in the host. Where disease does develop, convalescence sets in only when the bacteriophage finally gets the upper hand over the bacteria. In germ carriers, a state of balance or commensalism (as in the normal intestine) is regarded as having been established between the bacteria and the bacteriophage. When injected subcutaneously, the bacteriophage soon reaches the intestine, as shown by tests, while in septicemias it can enter the blood from the bowel and exert its effect at any point in the body. The lysins of the bacteriophage possess an extremely high opsonic power. Bacteria resistant to the bacteriophage are simultaneously resistant to phagocytosis.

Experiments in avian typhoid and the hemorrhagic septicemia of the water buffalo showed that injection of bacteriophage virulent to the bacteria concerned produces an immunity to the disease. Bacteriophage injections in man produce no local or general reaction, even when the germ has developed at the expense of highly toxic bacteria such as the dysentery

and plague bacilli. Such injections produce immunity both through the presence of the bacteriophage and by exciting the production of specific antibodies. Experiments in avian typhoid and human dysentery showed that injection or ingestion of bacteriophage cultures exerts a curative effect; results are best when it is given early in the disease. D'Herelle regards the bacteriophage as playing a preponderant rôle in the defence of non-immune individuals, exposed to infection or already suffering from disease, whereas the phagocytes eliminate bacteria when immunity is already established.

The bacteriophage is killed in 90 per cent. alcohol in 2 days, but has survived 1:200 mercuric chloride for 4 days and 1 per cent. phenol for 7 days. It lives in sealed feces and filtrates for several years, and in the dried state for as long as 6 months. Its bacteriolytic action is slow at 15° C., much more rapid at 37°, twice as rapid at 41 to 42° as at 37° (Kuttner), and nil at 45 to 50°.

Twort in 1915 had already recorded the discovery of a filter-passing agent capable of killing and dissolving living streptococci. This agent could be passed on to numerous generations by transferring it to successive fresh cultures of staphylococci and filtering. He thought the source of this agent was probably the cocci or glycerinated cowpox vaccine with which he was working when the phenomenon was observed.

PREPARATION OF THE BACTERI-OPHAGE.-D'Herelle's method of obtaining the germ from liquid or semisolid material such as feces consists in suspending 2 to 5 Gm. of the material in 50 c.c. of bouillon. (The bouillon used must be alkaline, 6 c.c. of normal soda solution being added to 1 liter of neutral bouillon). The mixture is incubated at 37° C. for 12 to 18 hours, then filtered through sterile paper and a sterile earthen filter, such as the Chamberland. Four tubes of peptone bouillon having been inoculated from a 1day agar slant culture of the dysentery bacillus or other bacterium, there is added to the 1st of these tubes 1 drop of the filtrate; to the 2d, 10 drops, and to the 3d, 2 c.c., the 4th serving as control. These tubes are incubated for 18 to 24 hours. Even if they are then cloudy, the bacteriophage may nevertheless be present. This is tested by spreading about 0.02 c.c. from each tube over agar slants with a platinum loop. If a normal growth of dysentery bacillus results upon incubation, the bacteriophage is absent; if it is present, the dysentery cultures on the agar slants will show a broken-up, moth-eaten appearance, with clear areas of no growth. Where 1 or more of the 3 original broth cultures had remained clear, this would in itself have shown the presence of the bacteriophage, the amount or virulence of it varying according to the results in the several tubes.

The bacteriolytic virulence of a bacteriophage not active enough to cause lysis in the original bouillon tubes is readily enhanced, as described by d'Herelle, as follows: The bouillon suspension is filtered through infusorial earth, then through a Chamberland bougie. A slightly cloudy bouillon suspension of the bacterium in question (e.g., the dysentery bacillus) is prepared, 4 or 5 drops of the filtrate added, and the suspension incubated for 24 hours. If lysis has not occurred, this 2d suspension is filtered as before and the process repeated. The rising bacteriolytic power of the bacteriophage can be followed by observing the results in subcultures on agar slants. After a few repetitions, bacteriophagic virulence is so enhanced that lysis of the bouillon bacterial culture occurs when the few drops of filtrate are added to it and it is incubated.

D'Herelle also describes a procedure for counting the number of bacteriophages in any given filtrate. It is based on the number of clear spaces observed in bacterial cultures on agar slants, each clear space, under suitable dilution, being taken to represent a single unit of the bacteriophage. The method is thus similar to that customarily followed in counting bacteria. By this procedure, such figures as  $2\frac{1}{2}$  or 3 billion bacteriophages per c.c. of the original filtrate are obtained.

(A further step worked out by d'Herelle consists in so diluting a bacteriophage culture that only a single bacteriophage may be inoculated in a bacterial bouillon culture. For example, a culture containing 3 billion bacteriophages per c.c. is so diluted that but 1 six-billionth of a c.c. of it is added

to each of a series of bacterial cultures. In such an experiment, 4 out of 6 dysentery bacillus cultures developed normally-including agar slants-indicating that not a single bacteriophage had entered them with the minute amount of filtrate added. In the other 2 tubes, each receiving 1 or possibly 2 bacteriophages, the suspension showed increasing turbidity up to 4 hours, then a gradual clearing in the succeeding 10 hours. From the 5th hour on, subcultures on agar slants were negative, and at that hour the suspension was calculated to contain already 1½ million bacteriophages. This points to an extremely rapid rate of reproduction; furthermore, the multiplication of the bacteriophage seems to take place by successive starts, at intervals of about 75 minutes).

THERAPEUTICS.—The property of the bacteriophage of destroying bacteria has led a number of observers to investigate its possible utility in the treatment of disease. D'Herelle reported 5 cases of Shiga bacillus dysentery in children in which ingestion of bacteriophage cultures was the only treatment given. All had bloody stools, ranging from 5 to an uncountable number daily. All were cured bacteriologically and clinically in 9 to 14 days.

Successful use of the bacteriophage by subcutaneous injections in staphylococcic infections was reported by R. Bruynoghe and J. Maisin (C. r. Soc. de biol., 1xxxv, 1120, 1921). A. Beckerich and P. Hauduroy (Ibid., 1xxxvi, 168, 1922) reported 5 cases of typhoid fever and 2 of paratyphoid B treated with the bacteriophage by injection of 2 c.c. and in 3 instances also by injection of 1 c.c. In all, permanent defervescence occurred within 48 hours, though 2 cases died, possibly because of pronounced myocarditis or insufficient dosage. A sweat occurred 2 hours after the treatment. Two cases of pyelocystitis due to B. coli were also treated by injection of 1 c.c. of the corresponding bacteriophage, with permanent defervescence in 48 hours. In a case of pyelonephritis in pregnancy, Courcoux, Philibert and Cordey (Bull. Soc. méd. des hôp. de Paris, July 21, 1922) used the colon bacillus bacteriophage subcutaneously and also injected 15 c.c. into the bladder. After a distinct reaction for

48 hours, recovery promptly took place. W. C. Davison (Amer. Jour. Dis. of Childr., June, 1922) observed no definite results from the bacteriophage in 12 cases of bacillary dysentery, possibly because in most instances the treatment was begun late. The only 2 cases treated within the 1st week recovered.

In 11 cases of colon bacillus **pyelitis** or **cystitis**, Beckerich and Hauduroy (Bull. méd., Mar. 10, 1923) injected a bacteriophage preparation obtained from cases of puerperal pyelocystitis. In 6 cases the colon bacillus infection was rapidly and completely cured, and in 1, clinically cured. Cases in which the colon bacilli seem to resist the lytic action of the bacteriophage are not suitable for the treatment.

A. Alessandrini and R. Doria (Policlin., Jan. 28, 1924) prepared from the feces of a typhoid patient at the beginning of defervescence a polyvalent bacteriophage yielding complete lysis of 5 typhoid strains in 6 to 8 hours. This preparation retained its activity undiminished for months. The writers used it in 18 cases of typhoid fever, giving it by mouth, with or without subcutaneous, intramuscular or intravenous injection. It was always well borne, though doses of 2 to 4 c.c. subcutaneously or intramuscularly caused a transient local reaction and intravenous injection caused colloidoclastic shock in 3 out of 4 cases. By either route it caused a transient rise of temperature. In 1/2 the cases the course of the disease was shortened, the temperature reaching normal in 6 to 8 days, at whatever stage of the disease the remedy was used. Results were best in the cases in which the individual typhoid strain present showed itself most susceptible to the lytic effect

D. Herderschee and L. K. Wolff (Nederl. Tijd. voor Geneesk., June 14, 1924) have also used the bacteriophage in typhoid fever, and deem it of definite, though not specific, utility. Of 105 cases receiving the treatment in an epidemic, 15 died, as against 20 deaths among 95 cases not receiving it. They prefer this treatment to the injection of killed typhoid bacilli. They use a mixture in equal parts of 2 bacteriophages which, according to d'Herelle, antagonize all known strains of the typhoid germ. Recovery occurred very rapidly

under the treatment. Usually 2 injections were given at an interval of 2 or 3 days.

As the bacteria react to the lysin by the formation of antilysins, which impede the therapeutic action, the 1st injection of the bacteriophage is much more active than later ones, according to K. Marcuse (Deut. Med. Woch., Mar. 14, 1924). Parenteral injections vary in efficacy according to the accessibility of the seat of infection to the lysin. Thus, the best procedure is, if possible, to apply the bacteriophage locally to the affected area. This the writer did in experimental colon bacillus cystitis in guinea-pigs. When 0.2 c.c. of active lysin was twice introduced directly into the bladder, the urine cleared up completely in 9 days, while still showing an abundance of colon bacilli in the control animals.

A bacteriophage filtrate showing marked polyvalence to colon and dysentery bacillus strains has been prepared by E. Zdansky (Wien. klin. Woch., May 15, 1924) from sewage. Twenty-eight different strains of colon bacillus were dissolved completely, with 1 exception, by this filtrate.

E. B. McKinley (Arch. of Int. Med., Dec., 1923), in a variety of cases, administered the bacteriophage subcutaneously, by duodenal tube, into wounds, on dressings, by ureteral catheter, intranasally, intraaurally or by mouth in amounts ranging from 1 to 50 c.c., with encouraging results. It proved harmless even in the larger doses. (Davison in 1 case gave 1300 c.c. without bad effects). The bacteriophages, obtained from various sources, were enhanced in virulence by d'Herelle's method [see preceding section of this article] until sterile agar subcultures were obtained. The filtrate—usually 30 to 50 c.c.—was then allowed to dissolve bacteria in increasing numbers on 5 successive days up to a total of 30 billion bacteria, this process affording a species of standardization of the bacteriophage. The filtrate remaining clear, further filtration was nevertheless carried out as a precaution and the filtrate incubated for 24 hours to prove its sterility before clinical use.

In 4 cases of chronic suppurating wounds—3 following removal of a piece of bone in compound fracture—injections of 1 to 3 c.c. of bacteriophage into the wounds were followed by cessation of the profuse dis-

charge and prompt healing. Usually the 1st injection led to an abrupt reduction of discharge within 24 hours; altogether 3 to 6 injections were made. In a case of staphylococcic pyelitis following removal of a kidney stone, 4 injections, each of 8 c.c. of bacteriophage, into the renal pelvis through the ureteral catheter at 3-day intervals were followed by a rapid clearing up of the condition. In a case of streptococcic abscess of the lung with profuse, foul discharge following rib resection and drainage, the odor and discharge practically ceased in 2 days after injection of 30 c.c. of bacteriophage into the cavity, and after 2 further injections at 3-day intervals the wound healed and the patient was discharged 8 days after the 1st injection. In a case of chronic dysentery of 9 years' standing showing the Flexner dysentery bacillus, administration of 30 c.c. of bacteriophage through the duodenal tube on 2 occasions, I week apart, relieved the symptoms in a few days, and the patient was quite well for over 2 months. In 2 cases of chronic maxillary sinusitis, intranasal use of bacteriophage cultures from sterile atomizers was followed by profuse discharge for 1 day, then absence of discharge for 10 to 14 days, after which the discharge recurred. In a case of chronic otitis media with discharge, originating in scarlet fever many years before, introduction of the bacteriophage into the ear in 1-c.c. amounts was followed by complete subsidence of the discharge. In 3 cases with a clinical diagnosis of subacute catarrhal cholecystitis, use of a stock bacteriophage by duodenal tube in amounts of 15 to 50 c.c. was followed by complete relief of symptoms for 2 to 3 months, after which the symptoms returned in a milder form.

In 20 positive cases of bacillary dysentery, R. C. Spence and E. B. McKinley (South. Med. Jour., Aug., 1924) started giving 10-c.c. doses of bacteriophage—previously put up in ampoules—by mouth 3 times daily immediately on admission. The mortality in these cases was 10 per cent., and the 18 survivors were symptom-free on an average 5.8 days after the beginning of treatment, while in 12 control cases the mortality was 40 per cent. and the symptoms disappeared 12.8 days after the beginning of hospital treatment.

BALANTIDIASIS.—According to J. L. Greene and F. J. Scully (Jour. Amer. Med. Assoc., July 28, 1923), a number of cases of Balantidium coli infection have been observed in recent years in the United States, not only in Southern but also in Northern States. In the colder countries the chronic form often exists for years, with alternating constipation and diarrhea. The parasite is capable of producing serious effects, which in the late stages do not readily respond to treatment. No drug is especially efficient in overcoming the infection. The writers find dietetic treatment very useful. The patient is given 21/2 quarts of whole milk during the day, in small portions at regular intervals. After several days, 1 or 2 soft eggs are added. The only drug used is bismuth subnitrate in 15 grain (1 Gm.) doses on the 1st day or 2 to relieve the cramps and diarrhea. Later, when the bowels become sluggish, stewed fruits are given. This diet is continued until the feces are free from the parasite (8 to 20 days), after which it is gradually increased up to a full diet. Under this treatment, which is much simpler than the usual colonic irrigations and injections, the cramps and tenesmus cleared up in a few days and the stools soon became more normal. The parasites disappeared, and repeated later examinations for them were negative.

BARBITAL (VERONAL).—PHYSIOLOGIC ACTION.—The chief action of this drug, as noted by I. J. Sands (Jour. Amer. Med. Assoc., Nov. 3, 1923) is on the walls of the small vessels and capillaries, causing their dilatation. This results in slowing the circulation, reducing oxidation, dissipating heat, and lowering

the temperature. The slowed cerebral circulation and reduced O-CO<sub>2</sub> exchange in the brain capillaries are responsible for the hypnotic effect. On subcutaneous injection of sodium-barbital, Bachem recovered about 90 per cent. of it in the urine, but after larger doses, only 45 to 50 per cent., the remainder being retained in the body. Fatal cases generally show at autopsy a general hyperemia of all organs. The drug may be recovered from the viscera.

POISONING.—Acute poisoning results usually from doses exceeding 50 grains (3.25 Gm.), though rarely toxic symptoms follow the ordinary doses of 5 to 10 grains (0.3 to 0.65 Gm.). Most cases taking 50 to 125 grains (3.25 to 8 Gm.) have recovered; above the latter amount, recovery is not common. In acute intoxication the patient is usually comatose. The face is flushed, lips and finger tips somewhat cyanosed, and limbs cold and clammy. The urine is scanty and contains traces of albumin and casts. Other symptoms are coated tongue, foul breath, constipation, incontinence of urine and feces, and diminished or absent reflexes. Spontaneous contraction and dilatation of the pupils, as well as nystagmus, are frequent. Ptosis may exist. The coma may last 24 to 72 hours, and is followed by ataxia, dyssynergia, a thick, drawling speech and sometimes diplopia. Often a stage of delirium supervenes. The patient is irritable and at times ugly. The danger signs in the acute period are absence of abdominal and knee reflexes, and bronchopneumonic conditions.

According to A. Tardieu (Rev. de méd., Nov., 1924), the ratio of fatal cases is 20 per cent. The coma is sometimes preceded by a short stage of nausea, dizziness and restlessness. Vomiting is uncommon. With the coma may occur slight or even high fever. Other features sometimes diagnostically helpful are tonic and clonic spasms, salivation, sweating, and pallor or hyperemia of the face. The presence of the drug in the urine can be shown by acidifying it with acetic acid, clearing with calcium chloride solution, adding a little HCl, and extracting with ether, evaporation of which then yields crystals insoluble in water but freely soluble in dilute soda solution. Slight acidification of the soda solution with HCl yields crystals which set free ammonia when soda is applied to them. The chances of barbital poisoning are reduced by the use of sodium-barbital and the addition of ipecacuanha.

Chronic poisoning is marked, according to Sands (loc. cit.), by a general cyanotic appearance, possibly with erythematous lesions. The gait is ataxic and speech indistinct, often with omission of letters and The breath is foul, tongue syllables. coated and constipation persistent. The temperature is somewhat subnormal, bloodpressure low, and pulse slowed. pupils may be unequal and irregular, and reflex disturbances may exist. The mental attitude is irritable, speech somewhat incoherent, and perception quite dulled, often with defective attention, retention and association. The patients never have a clear insight into their condition, often complain of insomnia and restlessness, and may become quite deluded, blaming others for their failure of adaptation.

Many cases of barbital intoxication have been reported as simulating epidemic encephalitis, uremic coma and general paralysis, and even brain tumor and pneumonia have been considered diagnostic possibilities. The personality of the patients intoxicated by barbital has been overlooked. Most of the acute cases belong to the manic-depressive group, the large dose being taken during extreme depression, occasionally with suicidal intent. largest number of chronic barbital cases belong to the emotionally unstable type of constitutional psychopathic inferiority, unable to face possibly unpleasant reality. The drug gives them a rather spurious feeling of well-being, removing all sense of duty and responsibility. They are frequently alcoholic and excessive smokers.

TREATMENT.—Gastric lavage may be useful, according to Tardieu, if practised not over 6 hours after ingestion of the drug. In the 1st 2 days of coma, venesection to the extent of 500 or 600 c.c. sometimes leads to recovery. The semi-sitting posture is indicated as a prophylactic against hypostatic lung congestion. Saline infusions are serviceable to stimulate diuresis. The patient should be fed artificially, and caffeine and strychnine may be useful as stimulants. Sands refers to the

need of early elimination of the drug. High colonic irrigation, catheterization and warm packs are valuable. Cardiac stimulants and oxygen are very useful in the more serious cases. The patient must be kept warm. Lung complications must be anticipated and energetically combatted.

BARTHOLINITIS.—In 10 early cases of gonorrheal bartholinitis, involving 15 glands, Hübner (Deut. med. Woch., Jan. 4, 1924) had excellent results from injection of 2 or 3 c.c. (32 to 48 minims) of citrated blood ½ cm. (½ inch) above and below the duct, to a depth corresponding to the surface of the gland. H. Sieber (Zent. f. Gyn., Sept. 27, 1924) recommends local X-ray exposures. The gonococci disappear after 2 treatments.

According to E. D. Barringer, A. W. Williams and M. A. Wilson (N. Y. State Jour. of Med., Apr., 1922), diseased Bartholin's glands should regularly be excised, preferably by the vaginal route. The chief danger is hemorrhage, which should be carefully controlled at the time of operation. C. Thélin (Rev. franç. de gyn. et d'obst., July 25, 1924) recommends excision in recurring inflammation of these glands. In his 2 cases complete recovery had taken place in 1 or 2 weeks.

BARLOW'S DISEASE.—See Infantile Scorbutus.

BASAL METABOLISM.—The basal metabolism or basal metabolic rate refers to the minimal heat production of the body, measured 12 to 18 hours after ingestion of food (post-absorption state) and with the body at complete rest in a comfortably warm environment. The amount of heat produced is taken as an indication of the level of vital activity, and while heat is the natural result of the oxidative processes constituting a large

portion of all tissue activity, the metabolic rate can be determined not only by direct measurement of the heat thrown off, but also indirectly by measurement of the oxygen intake, the CO<sub>2</sub> output, or both.

Advances in the study of basal metabolism in recent years have concerned chiefly a simplification of the clinical procedures and the collection of further data relative to the practical significance and utility of determinations of the metabolic rate.

APPARATUS AND TECHNIC.—

Direct calorimetry, requiring the use of a complicated and expensive respiration calorimeter chamber, is availed of only in a few specially equipped institutions, and is ordinarily replaced by indirect calorimetry, of which 2 varieties exist. The 1st is known as the open circuit method: The expired air from the patient is received in a spirometer bell or bag, from which samples are then removed for determination of the oxygen and CO2 content. This method is time-consuming and calls for relatively complicated gas analyses. The procedure generally adopted, therefore, is the closed circuit method, in which the patient breathes out of and into a spirometer bell containing oxygen, the gradual descent of the bell as the oxygen in it is consumed affording the required data for metabolic rate determination. The respiration of oxygen instead of air does not vitiate the results, it being a known fact that when oxygen is breathed the amount of oxygen taken up by the blood and used in the tissues is the same as when ordinary

The recent closed circuit forms of apparatus are practically identical in principle, and the following description of the Roth-Benedict apparatus, condensed from H. F. Moore (Lancet, Jan. 31, 1925), will suffice for general guidance: The cylindrical spirometer bell is suspended by a pulley over a double-walled cylinder closed below and filled with water. In the inner space is a chamber filled with soda-lime (to absorb the CO<sub>2</sub>) connected through rubber tubing with the mouth-piece in the patient's mouth. There is also another

air is inspired. This circumstance permits

the use of a spirometer bell much smaller

than would be required if air were breathed

outlet from the oxygen chamber, with tubing leading to the mouthpiece. In this tubing is a valve which closes on expiration, while over the soda-lime chamber is a valve which closes on inspiration. Thus, when the patient breathes out, the expired gas passes through the soda-lime (which removes the CO<sub>2</sub>), and when he breathes in, he receives pure oxygen from the bell. The cord over the pulley carries a counterpoise weight, to which is fastened a pointer with pen attached, the latter writing on a revolving drum, upon which a suitable time-marker also registers. As the bell falls and rises with each respiration, corresponding up and down strokes are recorded on the drum; but the tracing as a whole also gradually rises because of the progressive exhaustion of the oxygen in the bell, thus affording a record of the oxygen consumption in any given period

Corrections are made in the reading for temperature, barometric pressure and relative humidity.

The calculation is based on the assumption that 1 liter of oxygen absorbed by the patient corresponds to 4.825 calories set free (this being based, in turn, on 0.82 as the average respiratory quotient). To shorten the calculation as much as possible, with the Roth apparatus a 6-minute (1/10 hour) section of the tracing is used and the bell is constructed with a volume of 20.73 c.c. per mm. of its height. Thus, each millimeter of fall of the bell or rise of the tracing in the 6-minute period corresponds to 1 calorie per hour (since 0.2073  $\times$  4.825 = 1). If the tracing has risen 78 mm. in the 6 minutes, the liberation of calories per hour by the patient is 78. The temperature correction is made by comparison of the spirometer temperatures at the beginning and end of the test (the spirometer bearing a thermometer at its upper end). If a rise exceeding 1° C. has occurred, 0.5 mm. is added to the total rise of the tracing for each degree of temperature rise

The corrections for barometric pressure and humidity are made by multiplying by a factor obtained from a table.

Further mathematical manipulation of the result is required in order to obtain a figure comparable in all individuals and a basis for expression of the metabolic rate as a definite percentage above or below the normal. Rubner having suggested that the heat production of an individual is proportional to his surface area, D. Du Bois devised a simplified formula by means of which the surface area can be deduced with reasonable accuracy from the individual's weight and height. Thus:

Surface area =  $W^{0.425} \times H^{0.725} \times 71.84$ (W = weight in kilograms;

H = height in centimeters).

On the basis of this formula Du Bois has constructed a height-weight chart by means of which the surface area can be estimated at a glance. The Aub-Du Bois standards of normal basal metabolism for age and sex are regarded by Boothby and Sandiford as the best now available, and are as follows:

AUB-DUBOIS STANDARDS.
Cal. per sq. meter of body surface per hour.

Age	Males.	Females
8 to 9	54.0	54.0
10 to 11	51.5	50.0
12 to 13	50.0	46.5
14 to 15	46.0	43.0
16 to 17	43.0	40.0
18 to 19	41.0	38.0
20 to 29	39.5	37.0
30 to 39	39.5	36.5
40 to 49	38.5	36.0
50 to 59	37.5	35.0
60 to 69	36.5	34.0
70 to 80	35.5	33.0

Thus, if, as in 1 of Moore's cases, a male aged 42, the corrected calories per hour for the individual are found to be 68.39 and the body surface, 1.85 sq. meters, 68.39  $\div$  1.85 = 36.97 = calories per sq. meter per hour. The normal according to the Aub-Du Bois table being 38.5, 38.5  $\div$  36.97 = 1.041, that is, the metabolic rate for the individual is deficient to the extent of 4.1 per cent., and is expressed in round figures as -4 per cent.

In certain newer methods, the body surface factor has been eliminated and the standards based on weight and age, with or without the stature. Among the most widely used *formulas* are those *of Harris* and *Benedict*, as follows:

For men and boys (down to 10 kilos.):

H = 66.473 + 13.752 w + 5.003 s - 6.755 a

For women (not under 21 years):

H = 655.096 + 9.563 w + 1.850 s - 4.676 a(H = heat production in calories per 24 hours.

w = weight in kilograms.

s = stature in centimeters.

a = age in years.)

From these formulas the normal heat production for any given weight, height and age can be calculated and the results from tests in individual cases compared with the norm.

Dreyer has devised another formula, in which stature is disregarded and correlation based wholly on age and weight (as well as sex). The calculation is somewhat more intricate than in the methods above referred to, but has been simplified by tables presented by Stoner (Boston Med. and Surg. Jour., Aug. 16, 1923 and Nov. 27, 1924).

The standards for children are still in a somewhat chaotic state. For females below 21 years of age, the standards of *Benedict* and *Talbot* (Carnegie Inst. of Wash., No. 302, 1921) and of *Benedict* (Boston Med. and Surg. Jour., Feb. 1, 1923) are recommended.

According to W. H. Stoner (Ibid., Aug. 16, 1923), errors in metabolic rate determination due to improper preparation of the subject are by far the greatest in magnitude as well as in frequency. Unless the subject has the customary light supper the night before and 12 to 14 hours of fast, of which at least 7 are spent in sleep; unless he has no breakfast; unless he is brought to the metabolism station without effort on his part, and given ½ hour of preliminary rest, and unless he is at ease physically and psychically, the result of the test cannot be considered basal. Among the sources of error in the technic are leaks in the apparatus, maladjustment of the noseclamp and mouthpiece or mask, and infrequent renewal of the soda-lime.

P. Sainton and N. Péron (Paris méd., Dec. 8, 1923) maintain that in a given subject the most variable factor, with corresponding changes in the metabolic rate, is the respiratory output, i.e., the amount of air breathed in and out in a given time. When once the metabolic rate has been determined in the usual way, subsequent

changes in it can be followed with a fair degree of accuracy by simple determinations of the respiratory output with a mask and spirometer.

CLINICAL FINDINGS AND APPLI-CATIONS.—Deviations of 10 to 15 per cent. above or below the normal metabolic rate are not incompatible with a normal state of health. In a given individual, fluctuations of 2 to 5 per cent. may occur. As noted by E. F. Du Bois (Trans. Phila. Co. Med. Soc., Jan. 9, 1924), the basal metabolism is increased in hyperthyroidism, in the leukemias (in direct proportion to the increase of white blood cells), in nephritis, asthma, anemias, hypertension, acromegaly and some cardiac diseases. In any of these it may run as high as +40 per cent. In doubtful cases showing symptoms of both hypo- and hyperthyroidism, the metabolic rate is a most helpful adjunct; 15 per cent. above or below the average indicates a thyroid dysfunction unless there is another demonstrable cause. C. H. Frazier (Ibid.) finds the basal metabolism useful in deciding whether the operative procedure in hyperthyroid cases is to be a preliminary ligation or a primary subtotal thyroidectomy; in 70 per cent. of cases with the rate not above + 40 the gland is removed without the preliminary operation.

A warning is given by W. S. McCann (Medicine, Feb., 1924) that even if the metabolism is determined by the most accurate technic, under rigidly controlled conditions, a deviation from the normal can be properly interpreted only in the light of a most thorough clinical study of the case. In the last analysis, a diagnosis must rest upon the clinical observations. Basal metabolism determinations are invaluable in controlling the results of treatment in thyroid disease, especially hypothyroidism.

A. S. Jackson (Med. Jour. and Rec., May 7, 1924) finds the basal metabolic rate of great value in the differentiation of mild, incipient cases of exophthalmic goiter from those of cardiac neurosis, chronic nervous exhaustion, neurasthenia, and the nervous phenomena of the menopause. In girls a symmetrical thyroid enlargement at puberty may be accompanied by nervous symptoms, tachycardia and palpitation, and in a few of these, thrills and bruits are present;

a normal metabolic rate will assure the clinician that he is dealing with a vascular colloid goiter. In hyperthyroidism the metabolic rate is not an index of the patient's ability to withstand operation. A case with a rate of +44, but of only 3 months' standing, with recent rapid loss of weight and strength, beginning gastrointestinal disturbances and on the verge of a crisis, was considered a far poorer operative risk than one with a rate of +92 that had passed through a crisis and had a period of comparative remission of symptoms. In the latter case ligation was performed with only a mild reaction. Preoperative administration of Lugol's solution reduced the metabolic rate an average of 20 points in 30 cases, with proportionate clinical improvement. In colloid goiter the metabolic rate is chiefly of value in following the course of medical treatment with iodine, thyroid extract or thyroxin and determining the tolerance for them. Certain patients tolerate thyroid extract better than iodine and show much greater improvement with one than with the other. By pushing medication in children with colloid enlargement and yet keeping the rate between +5 and +15, one can greatly reduce or completely dispel many of the enlargements. In hyperthyroidism the diagnosis is frequently overlooked and treatment for chronic nephritis or anemia continued for long periods without result. A metabolic rate of -15 or more at once settles the matter. A variable rate is the rule in diseases of the other endocrin glands and in diseases such as pernicious anemia, pellagra, epilepsy, diabetes, arthritis and Hodgkin's disease. Tables bearing on 470 cases are presented by the writer. [See next page.

In 3 diseases commonly confused in their early stages—hyperthyroidism, neurocirculatory asthenia and pulmonary tuberculosis—the metabolic rate is of great diagnostic aid, especially if thyroid enlargement coexists, according to H. K. Mohler (Atlantic Med. Jour., Sept., 1924). In obesity, it distinguishes the cases due to diminished thyroid and pituitary activity, these always showing a subnormal rate. It is of prime importance in obese subjects with organic heart disease, especially if hypothyroidism is suspected, as alarming

 $\begin{tabular}{lll} Table I. \\ Study of the basal metabolic rate in \\ 470 patients. \\ \end{tabular}$ 

	Number of Patients	Average Basa Metabolic Ra
Exophthalmic goiter Adenoma with hyperthy-	56	+54
roidism	60	+38
thyroidism	78	+ 6
Colloid goiter	47	+ 2
Malignant thyroid	3	+12
Myxedema	2	-24
Hypothyroidism	15	-15
Obesity	12	- 2
Neurasthenia	12	+ 8
Chronic nervous exhaus-		1 0
tion		+ 7
Normal	31	+ 5
Cardiac neurosis	30	+10
Hypopituitarism	10	-11
Pellagra	ĩ	+ 9
Addison's disease	2 7	- 6
Pernicious anemia	7	$\frac{-6}{+2}$
Diabetes		- 6
Pregnancy		+ 8
Miscellaneous	60	+ 5

TABLE II.

## THE BASAL METABOLIC RATE IN EXOPHTHALMIC GOITER.

Average preoperative rate.	 	 					
Maximum rate							
Minimum rate							
Rate after one ligation	 	 ٠.					
Rate after two ligations	 	 		 			
Rate after thyroidectomy	 	 					

symptoms may be produced by thyroid extract in the obese with heart disease if the cause of the obesity is overeating and physical inactivity. In the nervous manifestations at the *mcnopause*, the metabolic rate will help decide for or against thyroid therapy. In many disease conditions there are phenomena which of themselves will increase the metabolic rate, *e.g.*, chills, sweats, fever, dyspnea, exercise, food, emotion, apprehension, anger, fright, tremor and menstruation.

G. Marañon and E. Carrasco (Ann. de méd., Feb., 1923) refer to a case of acute hyperthyroidism so intense as to render walking, use of the upper limbs and speech difficult, in which the metabolic rate was The highest rate found in the literature was one of + 170 recorded by Elliot. The writers agree with others who have pointed out a relationship of the degree of hypermetabolism to that of the tachycardia. Between the weight and metabolic rate there is not always a direct relationship, since a case may show marked variations in rate without any notable change of weight. Some cases of Graves's disease remain well nourished in spite of the typical symptoms and rise of metabolic rate. In the pseudo-hyperthyr-

oid vegetative neurosis (comprising neurasthenia, circulatory neurosis, irritable heart, vagotonia, etc.), the metabolic rate is far more helpful diagnostically than the adrenalin or thyroid test and the differential leukocyte count, though even so, doubt is not always removed, since in most instances the figures obtained are not over 20 points away from the normal. Ovarian insufficiency, which lowers the metabolic rate, often accompanies hyperthyroid states, and when it is pronounced, may even reduce the rate below normal, as not infrequently happens in menopause cases with slight hyperthyroidism. As some hyperthyroid cases show, superadded to their steady tachycardia, paroxysmal tachycardial attacks, the metabolic rate is useful in determining whether paroxysmal tachycardia in any given case is based on hyperthyroidism. In 1 case paroxysmal tachycardia was coupled with transient edema and a rapid gain in weight; the metabolic rate being — 16, thyroid gland was given, resulting not only in reduction of weight but also notable improvement of the tachycardia.

Any low metabolic figure suggests a thyroid inadequacy and justifies thyroid therapy, even if the clinical evidences of hypothyroidism are doubtful. Exophthalmos not of thyroid origin is differentiated by the metabolic rate. A young woman with menstrual disturbances, transient edema, rather pronounced vegetative symptoms and slight thyroid enlargement had been treated without success for hyperthyroidism; the metabolic rate proving to be - 18, iodine and thyroid extract were given, which increased the nervousness and insomnia but removed the edema and improved the metabolic rate; after an intermission, thyroid extract was resumed, whereupon the nervous symptoms also finally disappeared and the case was cured in 1 month. In 7 cases of hyperthyroidism attending the menopause the writers found metabolic rates ranging from +20 to +90; in 5 of these cases a goiter had become toxic at this period: In a case of post-operative menopause the rate was - 11, and marked improvement followed thyroid and ovarian treatment. Two cases of adiposogenital syndrome showed rates of 0 and -2, and 2 of prepuberty pseudohermaphroditism ("preadolescent type of hypopituitarism") showed — 19 and — 20. In acromegaly the metabolic rate is of much less value for diagnosis than as a guide for thyroid medication.

According to D. A. Haller and M. M. Clayton (Jour. of Lab. and Clin. Med., Apr., 1924), satisfactory basal metabolic tests in the physician's office are feasible with the Benedict portable apparatus. Among 291 patients the rate was above + 10 in 110 (24 per cent.) and below - 10 in 49 (11 per cent.). Among the latter 49, there was definite evidence of glandular system disturbance in 39 and probable evidence in 4. Of the remaining 6, 4 were poorly nourished, 2 probably having tuberculosis and 2 dementia precox. A rate below — 10 is usually of some diagnostic value. A normal rate eliminates hyperthyroidism as a diagnosis, but is not proof of thyroid adequacy.

The basal metabolic rate in typhoid fever has, as noted by W. D. Fleming (Jour. Philipp. Isl. Med. Assoc., Nov.-Dec., 1923), shown that toxic destruction of protein occurs in this disease and securely vindicated the high calorie diet. In myelogenous leukemia the increased rate parallels the number of immature myelocytes and leukocytes rather than the total white count, and may forecast an exacerbation some days before an increase in leukocytes occurs. No adequate explanation can be given for the increased rate in pernicious anemia. In paralysis agitans the increased rate is due to the inability of the patient to remain quiet.

In regard to the *nephroses*, J. G. M. Bullowa (N. Y. Med. Jour., Dec. 19, 1923) notes that Epstein and Lande have shown the association of diminished basal metabolism, edema and a high cholesterinemia. Thyroid extract is of value in obstinate edemas in this condition, and the high nitrogen diet may act in them by stimulating the thyroid. Metabolic rate determinations segregate the *edemas* amenable to thyroid therapy.

G. Wakeham (Jour. Biol. Chem., June, 1923) shows that there is a premenstrual rise of metabolic rate, and thereafter a distinct fall during or immediately after menstruation. H. F. and H. K. Root (Arch. of Int. Med., Sept., 1923) found a marked in-

crease during the later months of pregnancy. L. Kraul and G. Halter (Wien. klin. Woch., July 26, 1923) observed a reduction of rate by 17 to 30 per cent. in 4 women after ovarian sterilization with the X-ray. In uterine fibroid cases the average rate was + 30; this increased rate was lowered by hysterectomy.

In premature infants, Talbot, Sisson, Moriarty and Dalrymple (Amer. Jour. Dis. of Childr., July, 1923) found heat production very low when calculated on the basis of total production per 24 hours or per unit of body surface. The basal metabolism remains lower than that of the full-term infant for at least 3 months. Hence the need of great protection against heatloss for the premature baby.

As regards the possible effects of drugs on the metabolic rate, W. M. Boothby and L. G. Rowntree (Jour. of Pharm. and Exp. Ther., Sept., 1923) made a study of 25 drugs, such as acetylsalicylic acid, barbital, caffeine, cinchophen, codeine, iodides, morphine, radium water, strychnine and sulphonmethane. Given in single, moderate doses these did not influence the metabolic rate. Only adrenalin (0.5 Gm.) produced consistent changes of more than 10 per cent. in the rate within 2 hours of administration; a definite elevation of the respiratory quotient took place within this period. Caffeine seems to increase heat production, but only in large doses. Morphine in sufficient quantity to produce sleep lowers heat production. Insulin does not seem to possess a direct calorigenic action, but increases the rate in the fasting subject if the blood sugar falls to a critical level associated with symptoms of hypoglycemia. Thyroxin, like adrenalin, has a definite calorigenic action, but 1 which does not appear for several hours and reaches its height after several days. In metabolic rate tests neither adrenalin nor insulin should be given within several hours preceding the test. No test made within several weeks after taking thyroxin can be assumed to represent the lowest metabolism of the individual. Iodides do not affect the metabolism of a normal subject, but may convert a case of adenomatous goiter without hyperthyroidism into 1 with hyperthyroidism and correspondingly increased metabolism.

BENZOL.—POISONING.—Poisoning by benzol (benzene) is not uncommon in the rubber industry, in which it is used as a rubber solvent. H. J. Cronin (Boston Med. and Surg. Jour., Dec. 18, 1924), in a factory with which he was connected, found the greatest hazards in the "spreader room," in which rolls of cloth were run through a machine that spread a thin coat of rubber compound over its surface, after which the cloth was dried by evaporation of the benzol over hot steam coils.

SYMPTOMS.—In the milder cases the commonest symptoms were headaches, dizziness, gastrointestinal disturbances, weakness, mental dullness and irritability. In severe cases there was respiratory paralysis, cardiac collapse and death. In a fatal case, a buried benzol tank had sprung a leak and an 8-foot trench was dug around it. The victim, assisting in the tightening of a nut at the leak, became dizzy, pale and weak, but after a rest, went at the task again; he then at once collapsed, and died in 10 minutes. Another case, after a few days' rest, had weekly attacks of cardiac distress lasting 3 days for 4 weeks, eventually recovering. On entering the spreader room, the writer usually became dizzy and felt a constriction of the chest. Several of the 35 employees in the room were anemic, and all were prone to skin infections.

In chronic cases, benzol can cause marked destruction of the blood corpuscles and death results from rapid anemia and hemorrhage. Heim, Agasse-Lafont and Feil (Presse méd., June 7, 1924), in 30 cases, likewise among workers in rubber, observed, with the nervous symptoms, oral hyperemia, benzol odor of the breath, gastric cramps, high blood-pressure, nosebleed and aortic atheroma. Eosinophilia is common. According to Teleky and Weiner (Klin. Woch., Feb. 5, 1924), however, a lymphocytosis, exceeding 40 per cent., is the most typical finding; the red cells, hemoglobin and platelets are subnormal.

In chronic poisoning induced in rabbits by daily subcutaneous injections of an olive oil-benzol mixture, Weiskotten, Wyatt and Gibbs (Jour. of Med. Res., Sept., 1924) observed a temporary increase in the thrombocytes followed, coincidently with the necrosis in the bone marrow produced by the drug, by a progressive decrease of the thrombocytes. Later, active regeneration of the bone marrow was accompanied by a marked increase of the thrombocytes to above normal.

PROPHYLAXIS.—As noted by Cronin, dilution of concentrated fumes by adequate ventilation is the preventive. Over spreader machines there should be a suitable air exhaust to remove the hot rising fumes. Port holes in the wall close to the floor are excellent to remove the heavy descending fumes. Other measures are rest periods in fresh air and rotation of employment to fresh air positions.

TREATMENT.—In Cronin's cases this consisted of iron for the anemia, magnesium citrate solution for the gastric conditions, acetanilid for headache, and ammoniated mercury ointment and scrupulous cleanliness for the skin infections. Change of occupation was advised.

BENZYL COMPOUNDS. —Further clinical use of the benzyl esters has not afforded convincing support of the earlier recommendations of these compounds as clinically useful relaxants of involuntary muscle tissue, though favorable reports are still appearing in respect of certain individual disturbances, such as dysmenorrhea, angina pectoris and intestinal colic. According to C. M. Gruber and H. H. Shackelford (Jour. of Lab. and Clin. Med., July, 1924), bensyl bensoate taken in 30-drop doses 4 times daily for 4 to 18 days has no effect on the blood-pressure in patients with hypertension. Gruber (Ibid., Oct., 1923) had found that in dogs benzyl alcohol, benzyl acetate or benzyl benzoate had no effect on the blood-pressure; this differed, however, from the results of previous workers, who had given the drugs subcutaneously or intravenously.

According to D. I. Macht (Jour. of Pharm. and Exp. Ther., July, 1923), benzyl mandelate, a new ester of mandelic acid, produced a greater antispasmodic effect than the other benzyl esters, both its alkyl and acid components possessing this action. It markedly relaxed all smooth muscle preparations, especially when in tonic or

pronounced contraction. It is also notable in not having a disagreeable taste. When given by mouth in powdered form or capsules in cases of high blood-pressure, it caused a definite fall of systolic and diastolic pressure, even in small doses of 1 to 2 grains (0.06 to 0.12 Gm.), and symptomatic relief was experienced.

In spastic constipation C. D. Aaron (Amer. Jour. Med. Sci., June, 1923) deems benzyl benzoate serviceable in doses of 15 to 30 minims (1 or 2 c.c.) 3 or more times a day.

BERIBERI.—ETIOLOGY.—Observations by N. van der Walle (Nederl. Tijd. v. Gen., Sept. 20, 1924) indicate that the period of incubation of this disease is from 92 to 120 days. For protection against the neuritis, the rice used must embody a minimum of approximately 0.5 per cent. of P<sub>2</sub>O<sub>5</sub>. The disease developed in 2.79 per cent, of a large number of prisoners fed on polished rice from which the pericarp and the aleuronat layer had been removed. That some as yet unknown etiologic factor, aside from lack of the antineuritic vitamin, is involved is indicated by the development of beriberi in prisons using hand-ground instead of polished rice; by the increase of the disease during the rainy and decrease in the dry season, and by certain observations pointing to contagion from beriberi cases. A microbic invasion may be the final factor in inducing the disease when the system is undermined by the defective diet.

A somewhat similar conception is expressed, with reference to beriberi in India, by R. McCarrison (Brit. Med. Jour., Mar. 8, 1924), who reaffirms the conclusion he reached in 1919, that vitamin deficiency is rarely the sole cause of the disease. There are factors active in endemic

areas, apart from a too exclusive rice dietary, which are absent or of feeble potency in non-endemic areas. While under-milled and parboiled rices are protective against beriberi outside of the endemic zone, they sometimes fail within the latter zone. Among prisoners the disease originates only in the endemic zone, though the diet of prisoners elsewhere is the same. The writer believes in the existence of a poison which imparts to polyneuritis the characteristics of true beriberi; it is peculiar to certain places or is evolved in persons residing or who have resided for considerable periods in certain places, and its operation is rendered possible by the insufficient intake of a certain vitamin or vitamins in a diet excessively rich in starch and deficient in suitable proteins. Having produced in pigeons, with the rices used in India, 4 distinctive beriberi-like diseases, the writer deems it probable that a similar variety of conditions occurs in man.

Explosive outbreaks of the epidemic dropsy form of beriberi are reported from India by J. W. D. Megaw and S. P. Bhattacharjee (Indian Med. Gaz., Apr., 1924). Such outbreaks soon subside, independently of any change in the diet or method of cooking. In 70 cases observed by the writers, the cases occurred simultaneously in separate small groups of persons in limited areas. No evidence could be found of dietary deficiency as an important etiologic factor, though there was a possible association with stored rice, the parboiled rice used by 3 groups having been stored at least a year. Rapid improvement occurred on a modified diet or substitution of rice from a different source and in smaller quantities.

M. Nagayo (Jour. Amer. Med. Assoc., Oct. 27, 1923) dissents from the view of

Dutch investigators that beriberi can be identified with the rice disease (avitaminosis) of fowls. Among the clinical differences are the following: Anemia is observed in rice disease, not in beriberi. There is lymphopenia in rice disease, but often lymphocytosis in beriberi. Emaciation is common in rice disease; in beriberi no atrophy is seen, except in chronic cases. Hyperglycemia is common in rice disease; not in beriberi. In rice disease, one sees, in addition to paresis, jactitation, ataxia and coma; not in beriberi. In beriberi there are cardiac symptoms, with circulatory disturbance, especially venous stasis, which is never found in rice disease. Anorexia and intestinal disorders are common in rice disease, but are not marked in beriberi, except that constipation is common. There are also differences in the pathologic conditions of various organs; among these are the suprarenals, the medulæ of which are sometimes hypertrophied in grave beriberi, while in rice disease hypertrophy of the suprarenal cortices is common. Again, in avitaminosis the amount of vitamin B in the tissues and organs is remarkably decreased; not so in beriberi. Furthermore, a condition similar to experimental rice disease can occur in man-a peculiar form of farinaceous malnutrition (Mehlnährschaden) seen in badly nourished infants of the poor, continually fed with solutions of polished rice powder. In 2 such cases the writer found pathologic features exactly coinciding with those of rice disease. He does not maintain, however, that beriberi has nothing to do with a rice diet or with vitamin deficiency in food, nor that vitamin B may not produce good results in preventing or curing beriberi.

PROPHYLAXIS AND TREAT-MENT.—In a period of rice shortage in Malaya, as described by C. E. Cobb (Indian Med. Gaz., Aug., 1924), the quantity of rice consumed by coolies was cut down by about ½ and the difference made up largely with flour. Larger amounts of vegetables were also consumed. During this period beriberi was observed to dis-

appear; later, when the rice shortage was ended, it returned. The conclusion reached is that the elimination of beriberi from Malaya does not require complete prohibition of white rice, but merely a restriction of importation of the more highly polished varieties of white rice together with an increase of vegetables and flour in the diet. Similarly, K. Ohomori (Japan Med. World, Nov., 1923) advocates for preventive purposes the addition of vitamin B in the diet. This may be done either by increasing the intake of accessory foods rich in vitamin B if polished rice is taken, or by the substitution for polished rice of halfpolished rice, a mixture of rice and wheat, or a mixture of polished and unpolished rice or beans. millet and corn are also recommended. A most striking reduction of beriberi incidence in the Japanese Army was effected by adoption of a 6:4 rice-wheat mixture. Improved living conditions are also important.

In the curative treatment, 1 of many bran preparations may be used. If over 200 Gm. (6% ounces) of bran are taken the effect is immediate. For nervous disturbances massage or electricity may be employed.

Clinical observation and experiments have convinced D. B. Blacklock (Brit. Med. Jour., June 14, 1924) that lack of exercise plays an important part in determining an attack of beriberi where the necessary predisposing conditions of diet exist. All fowls on a diet deficient in vitamin B died in 17 days or less when kept in individual small cages without room for free movement, while of those allowed free movement none died in less than 31 days. Beriberi is notoriously a disease of confined quarters and fixed diet, as in prisons,

asylums, ships, etc. Tailoring, basketmaking and mat-weaving do not provide sufficient exercise for the inmates of institutions.

BILE.—Among the most notable of the many recent investigations relating to biliary physiology and pathology are those of P. D. McMaster, G. O. Broun and P. Rous (Jour. of Exp. Med., Mar., 1923), who studied the output of bile in dogs under various conditions. Vigorous exercise does not seem to increase the flow of bile. Hot weather may diminish it greatly, and during intercurrent diseases (unassociated with jaundice) it may almost cease. Fasting lessens the secretion. A meat diet increases it more than a carbohydrate one. Bile by mouth is an excellent cholagogue, but acts best in health, with the weather not oppressive and the food intake abundant. Heavy carbohydrate feeding produced only a transient increase of bilirubin excretion, and there seems no ground for the supposition that bilirubin is derived partly from the carbohydrates.

The same observers (Ibid., May, 1923) found that in partial biliary obstruction, the pigment, cholate and cholesterol outputs are all cut down, even more so than the fluid bulk of the bile. The resulting thinned bile probably accounts for the relatively slight trouble that arises from gall-stones in the hepatic duct. Another investigation showed that when the dogs were fed large amounts of the green bile or liver tissue of herbivora, their bile often changed from yellow-brown to green. When they were fed sheep bile, containing cholohematin, their bile contained this pigment. When they were fed dog bile in quantity, an increase of bilirubin output by the liver often followed. All these facts point to an enterohepatic circulation of bile pigment. That bile feeding is of benefit to man when losing bile through a fistula has long been acknowledged, but insufficiently acted upon.

A study of the effects of fluids and certain drugs on bile secretion has been made by O. Specht (Beitr. z. klin. Chir., cxxviii, 249, 1923) in dogs. Increased intake of fluids, whether given as milk or salt solution by mouth, subcutaneously or intravenously, resulted in no increase in the flow of bile

above the amount secreted on dry feeding. The amount secreted during different parts of the day varied little, and that secreted at night was the same as by day. The specific gravity of the bile was also practically constant. Of the drugs studied, thyroid gland, hypophysin, adrenal tablets and cholin caused no change in bile secretion. After thymus gland there was occasionally a slight increase of bile, and after pituitary anterior lobe extract, a considerable decrease.

The same observer (Ibid., cxxxi, 489, 1924), in tests on choledochotomized patients, found that different individuals showed distinct variations in bile excretion, but that in a given patient, fluctuations in the 24hour excretion of bile on a meatless diet did not exceed 50 per cent. Ingestion of fluid had no effect, and ingestion of carbohydrate almost no effect, on bile production, but meat ingestion always increased it markedly. Various cholagogues containing bile acids produced only a slight, irregular increase of bile when taken orally, but intravenous injections of sodium dehydrocholate in doses of 5 to 10 c.c. (80 to 160 minims) of a 5 or 10 per cent. solution produced a marked cholagogue effect, bile production being increased by 50 to 80 per cent. L. Kauftheil and E. Neubauer (Klin. Woch., Sept. 2, 1924), from tests in vitro, conclude that the compound just mentioned, which is practically nontoxic, may prove useful by ingestion to exert a bactericidal effect in inflammatory affections of the gall-tract.

Cholesterol being a major ingredient of gall-stones, P. D. McMaster's (Jour. of Exp. Med., July, 1924) studies on the influence of diet on the output of cholesterol in the bile are of interest. In dogs, when a diet rich in cholesterol was given, the amount of it in the bile was greatly increased. Addition to the ordinary diet of a bone mash diet containing but little cholesterol produced a similar, but less marked, increase. In the fasting dog, the cholesterol was greatly cut down, though its concentration per c.c. of bile was increased. In general, an animal eating largely puts out both much more bile and much more cholesterol, but the relation between bile quantity and cholesterol yield is not fixed.

DIAGNOSTIC TESTS.—A new test for bile pigments in the urine, bile and blood serum has been described by R. Kapsinow (Jour. Amer. Med. Assoc., Mar. 1, 1924). It is based on the observation, made in testing urine for indican, that all urines containing bile pigments when treated with Obermayer's reagent become a deep greenish blue at once. In applying the new test to the urine, 0.5 c.c. of Obermayer's reagent is added to 5 c.c. of urine. If bile pigment is present, a deep green at once appears. If there is only a faint trace, the color will appear after standing a few minutes in warm water. Bile diluted 1:1000 gives an immediate reaction. In the case of the blood serum, 4 c.c. of 95 per cent. alcohol are added to 2 c.c. of serum to precipitate the proteins, and the mixture is centrifugated. The clear supernatant fluid is withdrawn, and 0.5 c.c. of Obermayer's reagent added. The green color appears in a few seconds. The test is more sensitive than the Gmelin and Rosenbach reactions, giving a response up to dilutions of 0.000033 Gm. of pure bilirubin per cubic centimeter.

Bilirubin is normally present in the blood in a concentration of about 0.3 to 0.5 part in 200,000. Visible jaundice and excretion of bilirubin through the kidneys do not begin until a concentration of 4 parts in 200,000 is reached. Between these 2 concentrations there exists a state of mild hyperbilirubinemia or "latent jaundice" which has proven of some diagnostic significance. Detection of these slight excesses of bilirubin is usually carried out by means of the Van den Bergh test or the Fouchet test. The Van den Bergh test, as is well known, may be either direct or indirect. In the direct method, 0.25 c.c. of Ehrlich's diazo reagent is added to 1 c.c. of the serum (obtained by centrifugation) in a small test-tube. In obstructive jaundice, the color changes from pale yellow to violet or pink, owing to the formation of azo-bilirubin. In the indirect method, which is positive in both obstructive and non-obstructive jaundice, 1 c.c. of serum is added to 2 c.c. of alcohol and centrifugated; 1 c.c. of the supernatant fluid is then withdrawn and 0.25 c.c. of diazo reagent added to it. The color change in a positive test is the same as in the direct method. In

normal blood the change is always faint or absent.

According to C. H. Andrewes (Quart. Jour. of Med., Oct., 1924), the Van den Bergh test permits of distinguishing a frankly hemolytic from a frankly obstructive jaundice, but is of little value in differentiating icterus due to liver cell damage from other types of jaundice. It is helpful in distinguishing pernicious from secondary anemia, and when applied to other fluids, in deciding whether a hemorrhagic effusion or cerebrospinal fluid was previously blood-stained or had been stained by blood at the time of puncture, and whether aspirated blood has come from a hematoma or not. In conditions giving only the indirect reaction, bilirubinuria never occurs.

The Fouchet test is performed with Fouchet's reagent, which is made up of trichloracetic acid, 5 c.c.; 10 per cent. ferric chloride solution, 2 c.c., and distilled water, 20 c.c. In carrying out the test, 3 to 5 drops of this solution are added to an equal amount of the blood serum and mixed on a white porcelain surface. A green color, specific for bile pigment, develops if bilirubin is present to the extent of 1:60,000 or over. There is therefore no reaction whatever with normal serum.

From comparative tests, J. C. Friedman and D. C. Straus (Jour. Amer. Med. Assoc., Apr. 19, 1924) were led to recommend this test in preference to the Van den Bergh test for clinical purposes, it being simpler and less sensitive than the latter test and reacting only in the presence of a pathologic amount of bilirubin. In 29 cases of undoubted cholecystitis without evident jaundice, hyperbilirubinemia was shown by these tests to exist in 93 per cent, of cases during the attack and in 73 per cent. during the interval. No necessary relationship of it to the presence or absence of stones or to fever or leukocytosis could be shown. It is of value in deciding between cholecystitis and gastric or duodenal ulcer or carcinoma; no hyperbilirubinemia was found in 14 of the latter group of cases. It is of no value in excluding pneumonia, for out of 14 cases of pneumonia 7 showed latent jaundice.

Less conclusive results with the Fouchet test were obtained by F. A. Speik, E. N.

Liljedahl and M. A. Falk (*Ibid.*, June 28, 1924). It was positive in 67 per cent. of 40 patients with cholecystitis, but was also positive in a number of cases of duodenal and gastric ulcer, syphilis, tuberculosis, secondary anemia, hypertension, chronic myocarditis, angina pectoris, thyroid disturbances, etc., revealing a hyperbilirubinemia in these cases. Increase in the bile content could often be detected by simple observation of the clear serum; this was noted in 52 of all cases giving a positive Fouchet test.

## BILE DUCTS.—ASCARIASIS.

—While ascariasis of the biliary passages is often found only by accident, there are, as noted by G. L. Hartmann-Keppel (Jour. de chir., Feb., 1923), certain evidences that may, in conjunction with disturbances in the hepatic region, suggest its existence. These comprise enlargement and redness of the lingual papillæ, anorexia, salivation, indigestion, colicky pains, intestinal fermentation and catarrh, irritability, grinding of the teeth, itching of the skin, weakness, anemia, and the finding of ascaris ova in the stools. Locally, tenderness is suggestive. The possible effects of the condition include hepatitis, cholangitis, abscess and jaundice. The abscesses are generally of small size. Anthelmintics should be given as soon as possible. Emetine might be of value. For abscess or other infectious complications operative treatment may be indicated.

In a case described by A. Stanischtschew (Wratsch, Feb. 15, 1923) there had been frequent attacks of boring, non-radiating pain in the hepatic region for 12 years, together with pronounced ascariasis. Operation showed an ascarid in the common duct, without any gallstones or

apparent tissue changes. He believes a single parasite might cause death from common duct obstruction in the absence of hepatic abscess or cholangitis, and advises against the use of anthelmintics, lest the parasites be made to migrate further up in the duct. Operative exploration without undue delay is indicated, and drainage of the duct should follow the operation. Perthes (Arch. f. klin. Chir., cxxvi, 30, 1923) advises injection of anthelmintics through the drain.

INFECTION.—Bile duct infection unaccompanied by visible disease of the duct walls or suppuration has been termed cholangia by Naunyn. As described by F. Umber (Klin, Woch., Mar. 26, 1923), this condition may be either hematogenous or enterogenous. In the former variety the infection is regarded as beginning in the larger ducts and creeping up to the bile capillaries, giving rise to the clinical picture of cholangitis lenta, in which anhemolytic streptococci may be found in the blood. In the enterogenous type digestive disturbances are prominent. Jaundice is always present in involvement of the finer ducts, but the stools may retain their normal color if a portion of the liver is uninvolved. So-called catarrhal jaundice is sometimes a disturbance of this type. In the chronic cases subacute atrophy of the liver may result. Cholangia may be attended with colic in spite of the absence of stones, in which event differentiation from calculous disease is frequently difficult. Chills often occur at the outset, but the temperature may not be high; in the prolonged cases, there is usually remittent fever. Features of the condition are enlargement and tenderness of the liver and splenomegaly, and in protracted cases ascites, Banti's disease being thus simulated. According to L. Aldor (Arch. f. Verd., June, 1924), differentiation from calculous disease may be assisted by the presence of only a moderate bilirubinemia in colic attending cholangia, whereas in calculous colic this bile pigment is likely to be present in larger amounts. The germ most commonly responsible for cholangia is B. coli; less often, typhoid or paratyphoid bacilli or the staphylococci or streptococci.

Treatment.—In simple cholangia Umber advises rest in bed, hot applications over the hepatic region, a light diet low in fats, with marked restriction of meats, and the use of mineral waters. Where digestive disturbances are prominent, fast days and saline purgatives serviceable. In persistent cases, injection of 20 to 40 c.c. (5 to 10 fluidrams) of 20 per cent. magnesium sulphate solution through the duodenal tube was observed to cause rapid improvement in the symptoms, including the jaundice. Aldor recommends, in particular, hot enemas of Carlsbad water, 500 to 1000 c.c. (1 to 2 pints), together with combined hexamethylenamin and salicylic acid medication by the mouth. Cholecystectomy and drainage of the common duct may be tried in the more intractable cases.

STONES.—Stone in the common duct was found by W. D. Haggard (Jour. Amer. Med. Assoc., Sept. 1, 1923) in 6.2 per cent. of 273 gall-bladder operations. The mortality in 50 operations for common duct stone was 10 per cent. In operating

for cholelithiasis it is wise to open and explore the common duct whenever it is markedly dilated, whether a stone be palpable or not. In common duct stone, pain, when present, is either dull or colicky, occurring in spasmodic attacks with a rigor or chill followed by a characteristic steeple-like rise and fall of temperature. In the succeeding hours jaundice appears. In obstruction of the common duct by tumor pain is rare, but the writer was misled by pain and fever in 2 cases of malignancy. The X-ray is of not inconsiderable value in the detection of common duct stones, the X-ray report proving correct in 8 out of 10 cases. In obstruction of the duct, the phenoltetrachlorphthalein test is a useful indicator of how much surgery the patient will stand, the issue depending on the degree of impairment of liver function. In advanced cases, the urgent requirement is the relief of obstruction, and a 2-stage operation is safest, the 1st merely draining the gall-bladder or duct above the stone and the 2d being done for removal of the stone after the jaundice has subsided and the swollen liver returned to a normal size. tendency to bleed in the 10 or 12 days after operation is best controlled by preliminary blood transfusion and 3 daily intravenous injections of 5 to 10 c.c. (80 to 160 minims) of 10 per cent. calcium chloride solution.

SURGERY.—W. J. Mayo (Lancet, June 30, 1923) reports that in 1922 the mortality in 150 operations on the common duct for stone, infections, exploration, etc., was reduced, at the Mayo Clinic, to 2.6 per cent. A great reduction of mortality resulted from the careful preoperative management of jaundiced cases. The incision was generally a slightly modified

McArthur's method of Bevan incision. leaving undivided the posterior aponeurosis, peritoneum and nerves in the lower 1/3 of the incision is followed. The importance of removing all stones from the common duct cannot be overestimated; secondary operations on this duct may be very difficult. In cases necessitating secondary reconstruction because of operative duct injury not discovered at the time, direct union between the stump of the hepatic duct and the duodenum is the best procedure. In the drainage required after common duct operation in the jaundiced patient when marked duct infection exists, the Clinic uses hepatic duct drainage by the Robson catheter method. Walters has shown that in these cases the death rate following cholecystectomy is much greater than after cholecystotomy. The preoperative preparation, in addition to calcium chloride intravenously and blood transfusion if required, consists in introducing a quantity of water to aid renal elimination, preferably by proctoclysis or subcutaneously, and in the presence of hepatic insufficiency, in giving 5 per cent. glucose solution by rectum and 3 per cent. sodium chloride solution subcutaneously.

In common duct fistula F. H. Lahey (Jour. Amer. Med. Assoc., Mar. 31, 1923) deems implantation of the fistula into the duodenum by a method which he describes and has used clinically to be sufficiently simple and valuable to be included in the group of operative procedures available for this condition.

BILHARZIASIS.—TREAT-MENT.—According to F. G. Cawston (So. Afr. Med. Rec., Oct. 27, 1923), emetine must usually be continued for at least 28 days to obtain a permanent cure. The eosinophilia proves a fair index of the results of treatment, readings being taken before treatment and a week or 2 after cessation of it. The fact that the patient is in bed should not be permitted to obscure the gradually increasing cardiac depression sometimes occurring when ½ to ½ grains (0.03 to

0.1 Gm.) of emetine are injected intramuscularly on alternate days. Potassium antimony tartrate is usually the most serviceable antimony compound for intravenous use; toxic effects are much reduced by dissolving it in saline solution instead of distilled water. By not exceeding 1½ grains, except in those who stand larger doses without a reaction, this salt is seldom badly tolerated. Local use of 1 per cent phenol solution and an occasional hot sea-water bath are invaluable to prevent irritability in young children as a result of local discomfort from intramuscular injections. Bilharziasis predisposes to renal calculus and appendicitis. The same observer (Jour. of Trop. Med. and Hyg., Apr. 1, 1924) states that for a child of 9 years the maximum total dose of tartar emetic is 9 grains (0.6 Gm.) given in 24 days, not exceeding ½ grain (0.03 Gm.) at a single dose. Children of 12 usually require 12 grains (0.8 Gm.) and seldom tolerate over 3/3 grain (0.04 Gm.) at a dose. In children of 15 the corresponding amounts are 15 grains (1 Gm.) and 1 grain (0.06 Gm.). With care and the use of some drug to counteract the cardiac depression of most cases, 5 injections can be given in the 1st week, 5 in the 2d, 4 in the 3d and 3 in the 4th.

F. O. Lasbrey and R. B. Coleman (Brit. Med. Jour., May 24, 1924), reporting on 4600 cases treated in Cairo, deem sodium antimony tartrate less toxic than the potassium salt. In male adults, the initial dose is 1 grain (0.06 Gm.), increased by ½ grain (0.03 Gm.) with each injection up to 2½ grains (0.15 Gm.), which is the maximum dose. Injections are given daily for 6 days, then on

alternate days up to 12 injections. Weak patients and women and children receive proportionally smaller doses. The mortality among patients taking the course has been reduced ½, and is now but 0.49 per cent. The course enormously enhances the success of surgical treatment for bilharzial conditions.

Injections of a 10 per cent. solution of calcium chloride, 0.5 to 1 Gm., at first daily, then on alternate days, up to a total of 20 injections, were found valuable by Petzetakis (C. r. Soc. de biol., June 27, 1924) in recent cases with slight cystitis and living ova in the urine.

## BIRTH INJURIES.—PARALY-

SIS.—Obstetric brachial paralysis is, as a rule, of 1 of the following 2 types: (1) The upper arm type (Erb's paralysis), due to lesion of the suprascapular nerve and 5th and 6th cervical nerves at or about Erb's point. (2) The lower arm or whole arm type, less common, with added injury of the 7th and 8th cervical and 1st dorsal. Most observers agree, according to S. W. Boorstein (Jour. Amer. Med. Assoc., Mar. 15, 1924), with the "traction theory" of causation. It has been proved beyond doubt that the cause is not a congenital posterior dislocation. In the upper arm type sensation is normal, while in the lower type loss of sensation exists. No X-ray change is found after birth, unless fracture coexists. Epiphyseal displacement is hard to see on the plate.

Improper management of the shoulder in labor is responsible for many cases. In the prophylaxis, Ehrenfest advises that, in the Mauriceau-Smellie maneuver, the tip of the index and middle fingers be forked above the shoulders, not on the sides of the neck, but on the sternum of the infant. Severe traction, if necessary, should be made along the axis of the child and never against or on the head in lateral flexion.

Treated early and properly, mild cases may be expected to recover in 3 or 4 months; severe cases, in 6 or 7 months. To prevent stretching of the paralyzed muscles and contracture of the unopposed muscles the arm should at once be placed in a plaster cast or a wire or aluminum aëroplane splint, with the arm extending outward, the forearm directed upward from it and supinated. and the wrist dorsiflexed. shoulder should also be supported in the proper position, to prevent deformity. After 2 or 3 weeks the cast or splint is taken off for massage and gymnastic treatments, then reapplied or changed to a platform splint. Massage and exercises should be carried out daily, and the child not allowed to become obsessed with the fact that it has an arm which cannot be used. Movements should be stimulated by games or reaching for toys, or later by the use of dumbbells, etc. The support must be kept up for 8 or 9 months.

Nerve operations are indicated if no advance is made in 4 months. This occurs in some cases of the upper type and in many of the lower type. The plexus is exposed and the damaged nerve-ends sutured. In cases seen already with shoulder deformity, viz., adduction and internal rotation, the deformity is easily corrected by Sever's operation of tenotomy of the pectoralis major insertion all the way across the bicipital groove and of the subscapularis

tendon, followed by elevation of the arm in a splint, and in 10 days, massage, baking and exercises. Difficulty in supinating the forearm can be overcome by division of the pronator teres and attachment of its tendon to that of the flexor carpinadialis.

E. S. Smith (Med. Jour. and Rec., Apr. 16, 1924) states that if treatment is established within a few days after birth, many patients make a perfect recovery. If it is delayed for a few months, results will still be good, but not perfect; if delayed for several years, much or some good may result, but there will be little or no result in perhaps \( \frac{1}{3} \) of the cases. The brace, with a corset-like part for the body, should bear a splint so fashioned that the limb may be gradually raised laterally, with the elbow of the splint hinged so as to flex or extend the forearm during part of the time. The arm should be raised to nearly a right angle and semiflexed, and the extension further increased during a portion of the day time.

[See also Newborn, Disorders of.]

**BISMUTH.**—The bulk of the recent literature on this metal has been concerned with its use in the treatment of syphilis. A wide variety of preparations of it is being employed for the purpose.

PREPARATIONS AND ADMINIS-TRATION.—The use of neotrepol, a preparation containing 95 per cent. of bismuth in suspension in a sterile isotonic solution, is favored by H. J. Schwartz and O. L. Levin (Med. Jour. and Rec., Dec. 3 and 17, 1924). Of this solution, 0.5 to 2 c.c. are injected every 4 to 7 days, deep down into the muscle, with care to avoid escape of any of it into the fatty tissue. It is well tolerated, pain being practically nil and buccal symptoms rare. C. H. de T. Shivers (Arch. of Derm. and Syph., Oct., 1924) uses potassium bismuth tartrate with butyn (Dermat. Research Lab.), generally in weekly intragluteal doses of 0.1 Gm., or in some cases with more active lesions, 0.2 Gm.. Two courses each totalling 2 Gm. are given with an intervening rest period of 4 weeks, and finally a 3d course after a longer interval. Usually no local tenderness occurred, and there were no infections.

A. Catzeflis (Ann. des mal. vén., Apr., 1924) prefers quinine iodobismuthate (quinby), having found the sodium and potassium tartrobismuthate (trepol) painful and at times productive of dyspnea and albuminuria. The iodobismuthate, employed after mercury or neoarsphenamin, or alone in chancre and secondary lesions, was itself not always well borne, causing marked dental pain in 2 cases and albuminuria and pyelitis in 1 each. In the young and delicate, 0.1 Gm. is used as the initial dose. The needle employed in injecting should not have been used for loading the syringe. The injection is given slowly, and the skin pinched up as the needle is withdrawn. Rest for 30 minutes should follow the injection. H. Boesch (Schweiz, med. Woch., Nov. 15, 1923) usually injected trepol or quinby every 3 to 5 days in respective doses of 2 and 3 c.c. to a total of 20 injections.

The oxybenzoic acid compound of bismuth (bismogenol) was successfully used by H. E. Ahlswede and W. Busch (Med. Jour. and Rec., Sept. 17, 1924) in primary syphilis with heart disease contraindicating arsphenamin. Fifteen injections of 1 c.c. were given at intervals of 2 or 3 days. Bismogenol is a 10 per cent. suspension of the compound in oil. The compound itself contains approximately 60 per cent. of metallic bismuth.

S. Lomholt (Ugeskr. f. Laeger, July 24, 1924) recommends a suspension of bismuth in glycerin, made up as follows: Precipitated bismuth hydroxide, 10 Gm.; glycerin, 5 c.c.; distilled water, to make 50 c.c. It must be shaken just before use. The bismuth hydroxide soon renders it sterile. The dosage is 1 c.c. once weekly. Absorption is much more rapid than with the oily preparations. But little local pain is produced.

Though attempted by some observers, intravenous administration of bismuth is still, in general, deemed inadvisable.

A 10 per cent. bismuth ointment known as bismophan was found useful by F. W. Oelze (Klin. Woch., May 13, 1924) in the treatment of broad rectal condylomas, papules and oral mucous patches. The bismuth dosage used was the same as that of mercury. No pronounced effect on the serum reactions was

noted, although the Sachs-Georgi reaction became less strongly positive.

TOXIC EFFECTS.—The commonest toxic effect relates to the mouth, ranging from a simple pigmentation of the gums to gingivitis and ulcerative stomatitis. According to G. Armuzzi and R. Strempel (Gior. ital. delle mal. ven., Oct., 1924), the stomatitis is due to the precipitation of bismuth sulphide by H2S and its mechanically obstructive action in the finer blood-vessels as well as its destructive effect on their endothelium. Upon these injuries bacterial invasion is superimposed. As noted by Schwartz and Levin (loc. cit.), bismuth stomatitis often depends upon the presence of decayed teeth. With the black line on the gums there may be enlarged, black papillæ on the dorsum of the tongue. The stomatitis may be avoided by proper dental supervision, a hydrogen peroxide mouth wash, and finally by injection of contramin.

According to Hudelo and Rabut (Presse méd., Apr. 9, 1924), stomatitis is much commoner when the bismuth is given as a tartrobismuthate than when as an oxide or combined with quinine. Other possible effects are acute odontalgia and salivation. There is little disturbance of the alimentary tract, though in rare instances there develop severe attacks of gastric pain, with or without fever and vomiting. Jaundice and attendant hemorrhagic manifestations are very exceptional. Although possible harm to the kidneys has been widely alluded to, the writers noted only 4 instances of albuminuria in 10,000 injections. Skin eruptions are uncommon and devoid of seriousness. Lassitude is a usual condition during and after the treatment. Fever and pain in the joints and muscles are less frequent. Occasionally are met with such nervous symptoms as dizziness, nitritoid crises, headache and hemiparesis or paresis of the lower extremities.

The prophylaxis of such complications, according to these observers, consists in denying bismuth treatment to patients with many carious teeth, gingivitis, renal insufficiency, distinct hepatic insufficiency or poor general condition. It is not contraindicated by traces of albumin. Temporary suspension of treatment is indicated by increase of albumin or by gingivitis, jaundice or immediate skin eruptions. In late eruptions or ulcerative stomatitis bismuth treatment should

be abandoned. As a rule, no more than 0.2 to 0.25 Gm. of bismuth oxide or 0.3 to 0.4 Gm. of quinobismuth twice weekly should be given, and a rest period of at least a month should elapse after a series of 18 to 24 injections has been given. A. Pulawski (Rev. de méd., x1, 513, 1924) has reported a fatal case showing the extreme importance of careful and thorough observation of the mouth during treatment. In this case a 2d course of injections had been begun in spite of the recent appearance of ulceration and pain in the tongue.

After an intramuscular injection, bismuth can be traced in the muscle with the X-ray 4 or 5 days later. Veillet (Bull. Soc. méd. des hôp. de Paris, Jan. 12, 1923) and others have advised X-ray examination of the area of injection to make certain of complete absorption of the bismuth before a 2d course of injections is begun. According to Ahlswede and Busch (loc. cit.), the risk of bismuth accumulation is small-particularly with the oxybenzoic acid compound-provided the initial dose is carefully studied and dosage thereafter increased gradually under guidance of the blood picture. A sudden decrease of the white cells, especially the lymphocytes, or a sudden drop in the red cells calls for immediate cessation of the treatment and rest. Temporary stimulation with the Alpine sun lamp proved useful during these episodes.

According to H. C. Semon (Brit. Med. Jour., Apr. 12, 1924), the symptoms of bismuth stomatitis are rapidly relieved by intravenous injections of 0.45 to 0.6 Gm. (7 to 9 grains) of sodium thiosulphate in 5 c.c. (80 minims) of water on alternate days.

THERAPEUTICS.—Very many observers have reached the conclusion that bismuth is of special value in syphilis where other drugs are poorly borne, contraindicated or meet with resistance. The drug is regarded as having greater spirocheticidal power than mercury, though less than the arsenicals. It may be used alone or in conjunction with arsenic, mercury or both. Schwartz and Levin (loc. cit.) regard their observations as proving that bismuth destroys the spirochetes in the chancre, heals the latter quickly, dispels the adenitis and affects the serum reactions favorably. It may abort syphilis, but is not as reliable as arsphenamin for this purpose. In secondary syphilis it acts and reduces the Wassermann more quickly than

mercury, and there is less possibility of a Herxheimer reaction or neurorecurrence than after arsenic. It is also of value, though more slowly acting, in tertiary syphilis, neuro-syphilis and congenital syphilis. In neuro-syphilis the irritation as from arsenic is absent and there may be decided subjective improvement without other changes. Bismuth has proved of special importance in cases with arsenical dermatitis, Wassermann-fast cases and obstinate or recurrent cases.

F. Juliusberg (Urol. and Cut. Rev., Jan., 1925) agrees that bismuth intramuscularly acts more impressively on the symptoms than mercury, though it is less energetic than arsphenamin intravenously. It develops relatively few toxic properties as compared to arsphenamin and mercury. Seemingly, arsphenamin with bismuth acts more strongly than with mercury. He substitutes bismuth alone for mercury where arsphenamin is badly borne or the condition of the veins interferes with arsphenamin injections.

That bismuth has considerable prophylactic value against syphilis has been shown in animal experiments by Levaditi and Sazerac, as noted by Ahlswede and Busch (loc. cit.). Bismuth compounds either in ointment form or by intramuscular injection were found a certain protection against infection up to 3 hours from the time of invasion by the spirochetes.

[See also SYPHILIS.]

BLADDER.—CALCULI.—As a diagnostic sign of stone in the bladder G. Gaeta (Policlin., Mar. 19, 1923) alludes to a sensation of chilliness felt in the penis during the paroxysms of pain. Pallor accompanies it, and he ascribes it to a reflex vascular spasm.

TREATMENT.—To avoid various notable drawbacks of ordinary as well as cystoscopic lithotrity, A. E. Goldstein and J. F. Lutz (Jour. Amer. Med. Assoc., Dec. 8, 1923) combine litholapaxy with fluoroscopy in an air medium, thus securing the advantages of direct visual observation, reduced time of operation,

elimination of the possibility of accidents, ability to crush stones of large size, and absence of hemorrhage and trauma. With a soft rubber catheter, air is injected into the bladder to its full capacity, previously ascertained with fluid. Under the fluoroscope the calculus appears as a dark shadow and the air as a light shadow. Upon introduction of the lithotrite, the crushing of the stone is readily watched when the beak is turned to one side or the other. Any large pieces remaining are likewise crushed. One can always see if the beak of the instrument is pulling the mucosa, as an irregularity of the air shadow results. The duration of X-ray exposure required in the authors' cases was only 4 to 6 minutes. Anesthesia was either local, 3 ounces (90 c.c.) of 5 per cent. procaine solution being injected into the urethra and bladder 15 minutes before operation, or spinal, apothesin being used intraspinally and morphine and scopolamine subcutaneously. Ether is excluded by the presence of the fluoroscope.

Continuous irrigation of the bladder with a dilute solution of hydrochloric acid was used with success by J. Meyer (Ugeskr. f. Laeg., Sept. 18, 1924) for the dissolution of bladder calculi of hazelnut size. The procedure was carried out under X-ray and cystoscopic control, and was complete in 9 days. The method is being used in Rovsing's clinic for calculi consisting of carbonates and phosphates.

M. Singh (Indian Med. Gaz., Apr., 1923) reports a most unusual case in which the stone was so large and firmly lodged in the bladder that it could be

withdrawn only with the aid of obstetric forceps.

CYSTITIS.—See CYSTITIS, this Volume.

DIVERTICULUM.—Recent refinements of urologic diagnosis have greatly changed the status of this condition, formerly discovered, as a rule, only at necropsy or occasionally during exploration of the bladder for other lesions. Up-to-date procedures permit not only of the delimitation of diverticula, but also of the discovery of associated lesions or infection and of selection of the most appropriate type of surgical treatment.

H. B. Scargill (Brit. Jour. of Radiol., Sept., 1924) gives illustrations of the diagnostic use of the X-ray. The bladder is first washed out and emptied through a catheter, then filled with a 20 per cent. solution of sodium bromide. A 1st X-ray picture is taken with the patient on the Potter-Bucky diaphragm, the bladder emptied, and then another picture taken. The opaque bromide solution having remained in the diverticula, the latter are outlined in contrast to the bladder itself. Cystoscopy is also availed of.

treatment of bladder diverticula fails to afford security against fresh infection or other complications. While, as noted by E. S. Judd and A. J. Scholl (Surg., Gyn. and Obst., Jan., 1924), the diverticulum is harmless as long as its wall is able to contract regularly and empty its contents and is not infected, bladder obstruction, retention of urine, infection, and the not uncommon sequelæ, stone formation and malignant degeneration, make of diverticulum a

serious, and sometimes a rapidly fatal, disease.

Of 133 cases treated surgically at the Mayo Clinic from 1894 to 1923, 131 were in men. In 67.6 per cent. the diverticula were single. In 69.2 per cent. the incidence was between the ages of 51 and 70 years. No single method of treatment can be followed in all cases. In 50 patients excision was carried out (extravesically in 47), with an operative mortality of 6 per cent. In extravesical excision the bladder was opened suprapubically and 1 or 2 fingers were placed in the orifice of the diverticulum and used to exert traction on the sac, which was then dissected out, cut off at the neck, and the bladder closed with 2 rows of suture. In 37 other cases prostatectomy was combined with the excision of the diverticulum, with a mortality of 8.1 per cent., while in 44 cases merely palliative operations were performed, vis., prostatectomy and dilatation of the outlet of the diverticulum, 23 cases; outlet dilated and stones removed, 11; outlet dilated and bladder drained, 10. In 1 case the diverticular lining was curetted, with good immediate results.

The ureter was involved in the diverticulum in 5 cases; in 1 it was transplanted to a healthy portion of the bladder, and in 4, in which it was dilated, it was ligated and cut. In 20 cases there were stones; in 12 of these there were stones in the diverticulum. Carcinoma occurred in the diverticulum in 4 cases, of which 1 lived 2 years after resection of the sac. In 6 cases there was carcinoma of both bladder and diverticulum.

A new method of dealing with small diverticula is described by F. S. Schoonover, Jr. (Jour. Amer. Med. Assoc., Oct. 11, 1924). In Young's inversion method of handling small diverticula, it has been customary to cut the mucosal lining off and suture the wall. Instead of excising the mucosa, the writer places a mattress suture in such a way that its loop passes through the bladder wall on each side of the original orifice of the diverticulum. Being then tied tightly, it brings the bladder wall of the opening together entirely outside the diverticulum itself. The mucosa of the diverticulum is slightly redundant, but is not disturbed. The method is applicable only where the diverticulum is an outpouching of the mucosa through the muscular wall of the bladder, i.e., where the sac does not consist of the whole thickness of the bladder wall.

**EXSTROPHY.**—The most significant recent literature on the treatment of this condition has dealt with transplantation of the ureters into the sigmoid or rectum. described by W. E. Lower (Jour. Amer. Med. Assoc., Apr. 28, 1923), the essential principle consists in making the ureter run immediately under the loose intestinal mucosa for about 11/2 inches before it enters the lumen of the bowel. Operating by the intraperitoneal route, he did not have a single instance of infection among 10 cases. The average interval between the operations on the 2 sides is 2 weeks. After operation a rectal tube is used until the bowel becomes accustomed to the presence of urine. The rectum is also washed out with normal salt solution. In nearly every case sphincteric control for 3 to 4 hours was afforded by this operation.

Out of 35 patients with exstrophy who came under observation in the Mayo Clinic from 1912 to 1921, 28 were treated by transplantation of the ureters. C. H. Mayo's procedure

for the purpose is described by himself and W. Walters (Ibid., Feb. 23, 1924). The right ureter is first divided about 2.5 cm. from the bladder wall. A longitudinal incision is made through the rectosigmoid opposite the ureter down to the mucosa; the latter is merely punctured. The ureter, slit up for 0.6 cm., is drawn into the bowel by a suture fixed to its end, the needle emerging 1.2 cm. below it, in which position it is anchored by tying the suture externally on the bowel. Interrupted sutures approximate the intestinal muscle over it, alternate sutures catching a bit of the outer wall to hold it securely. Another continuous row of sutures is added. The ureter, thus covered internally for 3 cm. by the mucosa, is closed by any internal pressure, but is opened by outflowing urine. The left ureter is transplanted 10 to 14 days after the right, and the mucosa of the bladder excised by knife or cautery later. The operative mortality was 3.5 per cent. (1 out of 28 cases in which both ureters were transplanted). There were 4 deaths, however, following transplantation of the 1st ureter. In all the cases later traced the functional results were good, though several had died from causes unconnected with the operation.

## FISTULA, VESICOVAGINAL. —Thorough dissection of the anterior vaginal wall, generally affording enough mobilization for closure without tension, is emphasized by T. J. Watkins (Surg., Gyn. and Obst., Feb., 1925) in the operative treatment of vesicovaginal fistula. The vaginal mucosa is to be freed by blunt dissection with scissors, an inverted T-shaped incision through it.

with its longer limb interrupted by a circular incision around the fistulous opening, being made in the process; the mucosa is "skinned off" in
flaps with a sharp scalpel. Retraction and fixation of the injured tissues in chronic cases constitute an
important factor to be considered in
the operative treatment, especially
when the sphincter is involved.

Deep lateral dissection and firm
suture may establish urinary continence in cases in which the vesical
sphincter had seemed irreparably
damaged.

FOREIGN BODIES .- The impracticability of grasping and removing through the urethra foreign bodies such as paraffin, beeswax, gum and urethral pencils led H. L. Morris and C. I. Owen (Jour. Amer. Med. Assoc., Nov. 17, 1923) to test in vitro and in vivo (in dogs) the feasibility of dissolving these materials in the bladder. A number of observers had already reported cases of successful dissolution by injection of varying amounts of benzine, xylene or gasoline (12 to 62.5 c.c.), sometimes mixed with liquid petrolatum. The writers conclude from their tests that such treatment is effective and safe as regards the production of permanent damage to the bladder. For paraffin, the best solvents are xylene, pure benzene, high test gasoline, and benzine; for gum, high test gasoline, benzine, xylene and gasoline; for beeswax, benzine, xylene, high test gasoline and ordinary gasoline; for urethral pencils, pure benzene, "Ford benzol," and benzine. presence of water or urine in the bladder does not interfere with the action of the solvent.

An improved mechanical proced-

ure for the removal of objects small enough to pass through the urethra is described by F. B. Block (Ibid., Nov. 15, 1924). A double catheterizing cystoscope with a ureteral catheter in 1 of its channels is used. Through the tip of the catheter is passed a long silk ligature, 1 end of which enters the cystoscope along with the catheter while the other end passes out through the other (empty) catheter channel of the cystoscope. Upon introduction of the instrument thus prepared into the bladder, the objective lens is brought down close to the foreign body, and traction on the free end of the silk brings the catheter down in a loop around the foreign body, which is thus wedged against the elevator of the cystoscope and can be withdrawn with the latter.

IRRITABLE BLADDER.—According to W. W. Duke (South. Med. Jour., Oct., 1923), bladder irritability is often due to hypersensitiveness (allergy) to certain foods which the patients are in the habit of eating. The subjective symptoms resemble those of cystitis, and may be either mild or so severe as to confine the patient to bed. In uncomplicated cases, complete relief may follow immediately upon avoidance of the food to which the patient is sensitive.

Trigonitis as a cause of irritable bladder is emphasized by T. E. Hammond (Lancet, Dec. 27, 1924). In this condition there are severe bladder symptoms but few changes in the urine. Cystoscopy shows congestion limited to the trigone. No pathologic changes are detected in the neighboring pelvic organs. In the treatment, all the usual remedies beneficial in chronic cystitis fail, but

the application of diathermy to the trigone improves the symptoms immediately. The current used should be strong enough to produce a whitish appearance of the area over which it is applied. The cysto-urethroscope of the Brown-Buerger type is employed, with a broad electrode over the abdomen and the active electrode -insulated except at its tip-passed down the cystoscope. The current is applied in lines radiating from the internal meatus, with special attention to any erosions or fissures in this region or to any lesions of the urethra present.

RUPTURE.—A new procedure, said to afford an easy positive diagnosis as soon as complete bladder rupture has occurred, is described by R. T. Vaughan and D. F. Rudnick (Jour. Amer. Med. Assoc., July 5, 1924). Through a sterile catheter, with the patient under fluoroscopic observation, air is introduced into the bladder by means of a hand bulb. Usually 50 to 100 c.c. of air is ample, but 500 c.c. or more may be used if desirable. In intraperitoneal rupture the air is seen to escape into the abdominal cavity, finding its way upward between the intestinal coils to form a translucent layer beneath the peritoneum of the anterior abdominal wall. If the patient is made to sit up, the air is seen to collect between the diaphragm and liver. In extraperitoneal rupture the air escapes into the loose perivesical areolar tissue and is seen to spread along fascial planes, outside the peritoneal cavity. In negative cases the air simply distends the bladder. Four cases which proved positive under this procedure are reported in detail. The method allows the surgeon to avoid opening the peritoneal cavity in extraperitoneal cases.

TUMORS.—DIAGNOSIS.—Pneumoroentgenography of the bladder is serviceable, as stated by G. E. Pfahler (Radiol., Sept., 1924), in cases in which cystoscopy is impossible, or impracticable on account of the field being obscured by blood. The patient, indeed, finds it less painful and generally less objectionable than cystoscopy. A catheter is first passed and the bladder compressed until the residual urine is eliminated so far as possible. Air is then injected, slowly and with only the thumb and 2 fingers squeezing the rubber bulb, until there is complaint of distress, distention or desire to urinate. When the bladder is fully distended a hemostat is clamped over the catheter. Two films are then made with the patient in dorsal decubitus, and 2 more in ventral decubitus. A tumor appears as a solid body or mass projecting into the transparent air-containing cavity of the bladder. Cancers may be globular, flat or irregular; they have a broader base than any other type of tumor. Bladder diverticula can likewise be thus demonstrated if they are located on the lateral walls. procedure also shows rather clearly calculi in the bladder and general thickening of the bladder walls due, e.g., to tuberculosis in children.

TREATMENT. — Papilloma. — Fulguration has to a considerable extent supplanted suprapubic surgical removal in simple papilloma because of the shorter period of disturbance to the patient, the suitability of local anesthesia, the reduced danger of cystitis and, according to some, the lessened likelihood

of recurrence. As described by W. G. Ball (Brit. Jour. of Surg., Apr., 1924), the surface of the growth should usually be destroyed first, so that only dead portions of it shall fall onto the base of the bladder. Upon

reaching the base of the pedicle, this is attacked and coagulated, together with a small area of normal mucosa. Very careful bladder washing terminates the procedure. The procedure is inapplicable in very large growths and contraindicated in cystitis. H. H. Young and W. W. Scott (N. Y. Med. Jour., Sept. 5, 1923) state that in large tumors radium is of great assistance in causing rapid disappearance of the growth, and owing to the potential malignancy of all vesical papillomas, it should gener-

with an operative cystoscope and held firmly in position with a clamp fastened to a table is of first value and gives more brilliant results, though fulguration should be used in conjunction with it.

Suprapulic excision of papilloma is indicated according to A. Mala-

ally be applied, if possible. In malignant papillomas radium applied

is indicated, according to A. Malavasos (Zeit. f. klin. Chir., Aug. 11, 1924), where the bladder is nearly filled with tumors, severe hemorrhage exists, or the procedure causes severe tenesmus and fever; likewise, where any suspicion of malignancy In recurring papillomas, cystoscopy should be carried out at intervals of 1 to 3 months, to detect recurrences early and destroy them by coagulation. In cases treated by operation, the scar should be watched both externally and internally for recurrence, which would suggest malignancy and call for an ample resection.

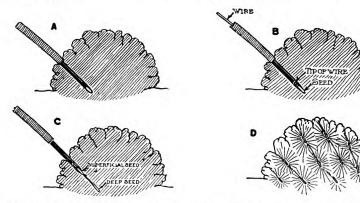
Carcinoma.—The gloomy outlook as to the curability of bladder tumors has been greatly mitigated by recent advances in treatment. As noted by Young and Scott (loc. cit.), fulguration, radium, the electrocautery and careful radical resection have transformed the situation, so that now about 95 per cent, of the benign and 75 per cent. of the malignant papillomas, about 50 per cent. of papillary carcinomas and 25 per cent. of infiltrating carcinomas are probably curable by 1 or more of these methods. The tumors usually involve the region of the trigone, ureteral orifices, and adjacent lateral walls of the bladder and vesical neck. Fulguration and radium conjointly are sometimes completely effective in papillary carcinomas. Where definitely malignant or very extensive, particularly if infiltrating, the growth should be attacked suprapubically, care being taken not to touch it or break off any papillary processes, and alcohol or resorcinol, 20 per cent., applied to destroy any that may have dropped into the bladder or wound. Several cases showed that exceptionally good results are obtainable by deep cauterization of infiltrating tumors with the red hot cautery, Paquelin or electric.

In a review of 527 cases of bladder tumor seen at the Mayo Clinic from 1915 to 1924, H. C. Bumpus, Jr. (Jour. Amer. Med. Assoc., Oct. 11, 1924) found that among 51 cases in which no treatment had been attempted on account of advanced stage or the patient's poor physical condition, the average duration of life after examination was 10.64 months, and in 2 instances, as long as 5 years. From the results in the

other cases after various kinds of treatment, it was concluded that radium alone is not successful in cases in which other methods cannot be used. It is most useful in association with fulguration or operation. Radium followed by operation gives poor results. Tumors of a low degree of malignancy that are too extensive to fulgurate or excise are best treated by the cautery. Tumors of higher degrees of malignancy call for excision or resection.

terior treatment through the suprapubic region, vulva and sacrococcygeal area.

Introduction of seeds of radium emanation into the tumor is advocated in certain cases by A. Hyman (Surg., Gyn. and Obst., Dec., 1924), who describes an improved form of the Barringer and Smith technic, making the procedure one readily carried out by the trained cystoscopist. No open operation is required, the seeds being implanted in the



A, Diagram of "seed" applicator in tumor of bladder. B, Same as view A, but showing a deep "seed" as deposited. C, The same as in view B, showing a superficial "seed" deposited. D, Diagrammatic view of cross-section of tumor, showing distribution of both deep and superficial "seeds." (Hyman, in Surg., Gyn. and Obst.)

According to H. A. Kelly and W. Neill, Jr. (Urol. and Cut. Rev., May, 1924), surgery is better unattempted in any carcinoma invading the bladder wall. In 142 cases treated with radium, there was definite improvement for a considerable time or an apparent cure in 53 cases. Sixteen cases have remained well for 3 years or more, and 5 were well over 3 years but died from some other disease. The different methods of using the radium were: (1) Implantation into the base of or into the tumor; (2) direct surface application; (3) intravaginal application through the vesicovaginal septum; (4) massive extumor through the cystoscope. The applicator consists of a flexible wire tube with a small loading chamber at the proximal end in which the seed is placed. A wire mandrin is then introduced and serves to plunge the tubes into the growth. Over 20 seeds can be implanted in 3/4 hour. The procedure is rendered painless by a preliminary procaine sacral anesthesia, combined with injection of procaine into the urethra and bladder. Each seed contains from 0.1 to 1 millicurie of emanation. The 1 millicurie seed gives off 132 millicuriehours of emanation during its life of 6 days and destroys 1 cu. cm. of tissue. The seeds with a smaller dosage-0.1 to 0.5 mc.-are preferred. In a small growth, the treatment may be completed in 1 sitting, while large tumors may require 3 or 4 treatments, given at intervals of 2 to 5 weeks. In a few weeks after implantation the tumor presents a white, sloughing appearance. The seeds remain in it until voided with the destroyed tissue. The method is an adjuvant to fulguration, and is also indicated in the aged and debilitated, those refusing operation, cases in which operation is inadvisable for various reasons, and in small recurrences of carcinoma or papillomas treated in other ways.

The X-ray is also being used in bladder malignancy. C. Heuser (Amer. Jour. of Roentg., Jan., 1924) reports 6 cases of large, inoperable cancer of the prostate and bladder, of which 5 had no evidence of recurrence 2 years after deep X-ray treatment. C. A. Waters (*Ibid.*) deems this measure serviceable in growths too extensive for resection or radium implantation. J. A. Hernández e Ibáñez (Rev. med. cubana, Apr., 1924) combines endoscopic diathermy with deep X-ray therapy.

Legueu, Marsan and Flandrin (Jour. d'urol., Aug., 1923), from trial in 9 cases, deem injections of mesothorium bromide a harmless but effective palliative. One cubic centimeter of a solution containing 1 microgram of the salt per c.c. was injected intravenously every 3 days. In addition, a solution of twice this strength was sometimes injected intramuscularly and was instilled in the bladder once a week in 5 c.c. doses. Most of the cases also were

treated by electrocoagulation, but in 2 receiving only mesothorium, pain and frequency were relieved and the bladder capacity increased.

Resection of the tumor, according to E. Joseph (Münch. med. Woch., Jan. 9, 1925), is of definite value only in the few cases in which the growth is near the apex of the bladder. In beginning cancer at the base, complete cystectomy is indicated. This eliminates the tenesmus and bleeding, though in the later stages it shortens life. Where operation is contraindicated or refused, cauterization with trichloracetic acid or thermocoagulation is beneficial.

BLOOD. -VOLUME.-The blood volume can readily be determined by the Congo red method, introduced by Keith, Rowntree and Geraghty. As described by A. Mendershausen (Zeit. f. klin. Med., Sept. 20, 1923), the procedure consists in injecting intravenously 10 c.c. of 1 per cent. Congo red solution. From the vein of the other side 6 to 8 c.c. of blood are taken and the serum used for comparison with a 0.01 per cent. Congo red solution in the Autenrieth colorimeter, from which the volume of the entire blood mass can be calculated. By this method the average blood content of the body proved to be 7.5 per cent. of the body weight. The quantity of blood was relatively less in obese subjects and subjects with a poor musculature, and greater in slender and muscular persons. In the anemias the blood volume is reduced to an extent paralleling the red cell count; this reduction may, however, be compensated for by dilution of the blood.

ERYTHROCYTES.—Polychromatophilia,—According to Koopmann (*Ibid.*, July 25, 1924), this condition is the result of a deficiency of lipoids. It is removed by mixtures of cholesterol, as is also the artificial polychromatophilia induced in blood smears by a few days' exposure to ether or alcohol.

Resisting Power.—As is well known, the resisting power of the red cells to hypotonic solutions is decreased in hemolytic jaundice and increased in pernicious anemia. Accord-

ing to Acél and Spitzer (Deut. med. Woch., Aug. 15, 1924), the resistance is increased about 35 minutes after a test meal in normal persons and those with gastric hyperacidity; increase of the carbon dioxide tension of the alveolar air occurs simultaneously. *In vitro*, a little sodium bicarbonate solution added to the blood was observed likewise to augment red cell resistance.

Sedimentation Test.—That acute inflammations were attended with an increased rate of blood sedimentation was brought out as long ago as the close of the 18th century by John Hunter. In 1916, Fahraeus called attention to the presence of this phenomenon in pregnancy, and since then numerous additional studies of it have been recorded. The diagnostic value of sedimentation tests is stressed by M. E. Alexander (Med. Jour. and Rec., June 4, 1924), who employs Linzenmeier's technic. Small test tubes of 5-mm. (1/2 inch) caliber are marked at 1 c.c. and also 18 mm. below this mark. Sodium citrate. 0.2 c.c. of a 5 per cent. solution, is first put in each tube and blood added to the 1 c.c. mark, to be followed by gentle shaking or stirring. Accelerated rate of sedimentation consists of settling of the red cells to the 18 mm. level in less than 1 hour (at room temperature). Addition of bile, even in very small amounts, seems greatly to delay sedimentation. In 40 cases of pregnancy, an increasing acceleration of sedimentation was observed after the 3d month, the average being 20 minutes and the range, 6 to 40 minutes. In 22 cases of active pulmonary tuberculosis, the rate was greatly accelerated (15 to 45 minutes), while in 12 healed or completely arrested cases it was normal (90 to 120 minutes); likewise in some cases of early renal tuberculosis and cervical adenitis. In 29 cases of acute inflammation (acute arthritis, erysipelas, lobar pneumonia, tonsillitis) there was marked acceleration. In 25 cases of chronic arthritis there was acceleration in 8; these 8 had acute exacerbations some days or weeks later, while the other 17 cases did not have any. The rate was extraordinarily accelerated during the exacerbations, though the temperature and leukocytes were but very slightly elevated. In 20 cases of late syphilis, the rate was increased. In 2 paretics the red cells settled in 6 minutes.

The test is of paramount value in differentiating inflammation of the pelvic organs

(sometimes unattended with fever or pulse acceleration) from tumors or cysts in the same region. It has been found serviceable in deciding the time for operation in *gonorrheal salpingitis*, in which it reveals the time when acute inflammation has subsided. In *pregnancy* it is of definite value in the 4th, 5th or even later months, when it becomes necessary to differentiate the condition from uterine myomas or cysts.

B. Friedlaender (Amer. Jour. of Obst. and Gyn., Feb., 1924) deems the test of some value in the diagnosis of unruptured ectopic pregnancy. Ruptured ectopic pregnancy, having about the same sedimentation time as pelvic inflammatory conditions, must be diagnosed by exclusion. A sedimentation time under 30 minutes means active infection, and under 1 hour, latent infection, contraindicating operation. A time over 2 hours excludes all possibility of a latent or active infection. No dilatation, curettage or other surgical procedure should be undertaken without doing a sedimentation test to exclude latent infection.

As stated by E. Rothe (Zent. f. Chir., Aug. 25, 1923), accelerated sedimentation occurs also in anemia and in disorders attended with increased absorption of katabolic products, viz., inflammatory processes, wounds, fractures, aseptic operations, and malignant tumors. It assists in distinguishing bone tuberculosis from osteochondritis, Perthes's disease and loose bodies in the joints. Esophageal cancer may be distinguished from cardiospasm or diverticulum, and cholelithiasis possibly from duodenal ulcer. In syphilis it is positive earlier and longer than the Wassermann. In convalescence in general it is a serviceable guide, subsiding much more gradually than the temperature and leukocytosis.

A definite relationship between the relative globulin content of the serum and the rate of sedimentation was noted by A. Salomon (Zeit. f. klin. Med., Mar. 20, 1924). In performing the test, Bronnikoff (Zeit. f. Gyn., July 5, 1924) employs the tube from Sahli's hemoglobinometer outfit and reads off the depth of the column of blood plasma every ½ hour.

LEUKOCYTES.—According to Mayr (Deut. med. Woch., Oct. 24, 1924) the number of leukocytes in blood from different parts of the body is always different. Comparing with the blood from the left ventricle

of animals or from a vein in man the blood in capillaries, the latter showed a greater number of neutrophiles and especially of eosinophiles. Making leukocyte counts with the body in various positions and during rest, Liebenstein (Klin. Woch., Aug. 12, 1924) found differences as high as 2900 in the same subject and a range of 3300 to 10,000 in 11 normal individuals. Isaacs and Gordon (Amer. Jour. of Physiol., Dec., 1924), in 17 subjects who had run a Marathon race, observed a relative and absolute increase of the polymorphonuclears and platelets in the peripheral circulation, seemingly due to a more thorough mixing of the blood of the internal and peripheral vessels, with resulting redistribution of its elements. Cipriani (Rif. med., Sept. 15, 1924) noted a tendency to leukocytosis in gastric hypersecretion and leukopenia in hypoacidity.

Several studies of the effects of the Röntgen ray on the blood have recently been published: Minot and Spurling (Amer. Jour. Med. Sci., Aug., 1924), working mainly with cancer cases, found the blood changes most marked after intensive short wave length treatments, whereas after moderate long wave exposures there were sometimes no changes. The effects consisted in a reduction in the white cell count, mostly below 5000, reaching its lowest point in about 6 days. The lymphocytes were particularly affected. blood contained many degenerated white cells, especially in the first 3 days. An eosinophilia, often of 7 and as high as 23 per cent., was usual 2 or 3 weeks after a short wave-length irradiation. A slight increase of the platelets soon after irradiation was common. No important changes in the erythrocytes or hemoglobin were noted. Rud (C. r. Soc. de biol., Aug. 12, 1924) found that the leukocyte count averaged 1000 below normal in workers in X-ray institutes.

Postoperative leukocytosis was studied in 30 cases by M. S. Witter (Surg., Gyn. and Obst., Jan., 1925). The cases were all of the "clean" gynecologic group (mostly with laparotomy), the object being to obtain an average normal count in "clean" operative cases with uneventful recoveries with which the counts in individual cases could be compared for diagnostic and prognostic purposes. The average curve rose from a preoperative level of 9000 to 18,000 on the 1st day after operation, then declined steadily to

10,000 on the 5th day, and finally rose to 13,000 on the 7th day. The highest level was actually reached in the 4th hour after operation, as shown by hourly study in 9 cases. The height of the peak seemed to vary directly with the duration of operation and extent of trauma, and the leukocytosis appeared to be mainly a polynucleosis. The temperature curve remained grossly, but not precisely parallel with the leukocyte curve; its peak was reached after the 7th hour. According to Schönbauer and Eichelter (Wien. klin. Woch., Apr. 17, 1924), the eosinophile count affords a better idea of the postoperative condition than the count of any of the other leukocytes.

In regard to the clinical utilization of leukocyte counts, R. A. Kilduffe (Amer. Jour. Med. Sci., Oct., 1924) emphasizes the fact that the greatest aid is obtained from the composite picture of several counts made at intervals of 2 or more hours. An increasing or sustained leukocytosis is of greater diagnostic and prognostic value than the findings of an isolated examination. Persistent leukocytosis is against the benignity of any tumor and a steadily increasing leukocytosis in malignant disease points to rapid growth or metastasis. In abdominal conditions leukocytosis does not necessarily point to sepsis, as it occurs also with abdominal hemorrhage. Absence or decrease of eosinophiles with increased percentage of polymorphonuclear neutrophiles is stated by Simon to be almost invariably present in pyogenic infections; if, in a supposed infection of this character, with the neutrophiles increased the eosinophiles are normal or increased, either the suspicion is unwarranted or the condition is being successfully overcome. W. C. Jones and C. E. Brown hold that an increased percentage of lymphocytes, if not excessive, is a favorable sign, while a decrease below normal is of unfavorable import. The writer strongly advises the charting of the leukocyte counts on square paper, and refers to Walker's index of body resistance, based on the assumption that for every 1 per cent. increase in the polymorphonuclear count there should be a corresponding rise in the total white count of 1000. Thus, if the polymorphonuclear percentage is 80 (10 above the highest normal, 70) and the total white cell count is 25,000 (15,000 above the normal 10,000) the index is +5, while if it is 15,000,

the index is -5. A positive index is of favorable import; a negative index, as a rule, unfavorable.

Blood

VISCOSITY,—The term "angiotrophosis" is applied by W. G. Stern (Jour. of Bone and Joint Surg., Oct., 1924) to the group of conditions known as Buerger's disease, Raynaud's disease and spontaneous gangrene, featured by pain, disability, numbness, etc., in the extremities. In 85 per cent. of such cases he found the blood viscosity to be 4.8 or over. In acute cases the treatment is rest in bed, electric light baths to the extremities, injection of Ringer's solution, 4000-6000 c.c., through the duodenal tube, sodium iodide intravenously, and a bland diet. Later, water should be taken freely to keep down the viscosity, chilling or compression of the body avoided, Buerger's circulation exercises availed of, and all forms of toxic absorption prevented.

**COAGULATION.**—The coagulation time was found by Murakami and Yamaguchi (Ann. de méd., Apr., 1924) to be related to the amount of fibrin ferment present, but not to the fibrinogen or calcium. In cases of prolonged coagulation time the rate of sedimentation was found much accelerated. Rapid sedimentation was associated with small amounts of fibrin ferment and calcium, but a large amount of fibrinogen. In jaundice the amounts of fibrinogen and fibrin ferment were very small. In severe pleurisy and lung tuberculosis there was increase of fibringen and decrease of fibrin ferment; the coagulation time was usually prolonged.

X-ray irradiation over the spleen or elsewhere was found by Pagniez, Ravina and Solomon (Presse méd., June 25, 1924) to shorten the clotting time to 1/4 the original period, beginning in 5 to 15 minutes after the exposure. The maximal effect was noted in the 1st 4 hours and persisted 4 to 7 days. Retraction of the clot was also accelerated. The action of the rays seemed to be upon the blood itself, though no such action occurred in vitro. In using the X-ray for the prevention or arrest of bleeding, the full dose (about 1/6 skin dose) should be used at the start or the exposure repeated before the effect has spent itself, otherwise the system appears to become refractory to the procedure.

In looking for a means of protection against intravascular coagulation which might prove

of value in the prevention of pulmonary embolism-now known to be a frequent cause of postoperative deaths—E. C. Mason (Surg., Gyn. and Obst., Oct., 1924) made tests with a hepatic product known as heparphosphatid, having a strong anticoagulant action. It was titrated against the most actively coagulant tissue extract, and found to neutralize this extract, preventing experimental thrombosis and embolism in rabbits. The anticoagulant, which is available in 2 c.c. ampules, would probably be of like service in man. It could be used as anticoagulant in blood transfusion or wherever the hypertonic action of excess salt is contraindicated.

BLOOD CHEMISTRY.—NITROGEN-OUS COMPOUNDS.—Discussing the significance of nitrogen estimation in the blood in renal and arterial disease, I. J. Levy (Jour. of Lab. and Clin. Med., Dec., 1923) states that in precapillary sclerosis uncomplicated by structural change in the kidney, or without cardiac decompensation, there is usually no disturbance of the nitrogen metabolism. Diffuse exudative inflammation of the glomeruli, however, is often attended with nitrogen disturbance. If productive inflammation ensues, their functional capacity is permanently reduced, and unless it is compensated for by hypertension and cardiac hypertrophy, retention results, with consequent strain on the circulation and a final break.

Increased blood urea nitrogen was found by I. M. Rabinowitch (Can. Med. Assoc. Jour., Nov., 1924) in over 80 per cent. of cases of intestinal obstruction, peritonitis and pancreatitis. In some cases it was noted even 24 to 48 hours before there was definite clinical evidence of obstruction or peritonitis. Usually, when the increase was persistently maintained, subsequent clinical symptoms developed and the cases terminated fatally. In chronic appendicitis and constipation the urea nitrogen was not increased.

In 40 labor cases, Williams (Lancet, Dec. 27, 1924) found an appreciable rise in the blood urea and non-protein nitrogen during the labor in normal cases. The average urea content rose from 19.0 to 28.2 mgm. per cent.

SUGAR.-Rabinowitch (loc. cit.) found blood sugar estimations of some value in the diagnosis of obscure upper abdominal lesions. Hyperglycemia was noted in over 75 per cent. of cases of pancreatitis and lesions of the gall-bladder and bile passages. The findings

A simplified method of blood sugar estimation for use in diabetes mellitus has been described by Becher and Herrmann (Münch. med. Woch., Oct. 17, 1924): With a carefully washed and dried pipette 0.1 c.c. of blood is obtained and promptly mixed with 1.9 c.c. of distilled water in a test-tube by drawing up the water several times into the pipette. To remove the protein, 1.5 c.c. of 1.2 per cent. picric acid solution is added, the tube shaken, and the precipitated protein caught on a small filter. Gentle warmth may be applied, if required, to make the precipitation complete. Of the clear, yellow filtrate 2.1 c.c. are placed in another tube, 0.3 c.c. of 4 per cent. sodium hydroxide solution added, and the solution then heated until the deepest obtainable brown color is secured—usually in 1 or 2 minutes. Finally, the solution is diluted to 2.4 c.c. in a small graduate. Under these conditions a definite brown coloration is observed where the blood sugar is high. Between 200 and 500 mgm. per cent. of sugar the color changes from a slight to a deep brown. If the sugar is normal, only a yellow or very light brown tint is seen against a white background.

ACETONE.-A simple, rapid test for acetone in the blood plasma, known as the Wishart test, is described by F. M. Allen (Jour. Amer. Med. Assoc., Feb. 28, 1925). A little plasma is placed in a small test-tube, and enough dry powdered ammonium sulphate added to supersaturate, so that after the test some of it will be seen at the bottom of the tube. A couple of drops of fresh sodium nitroprusside solution are next added and shaken, and then 1 or 2 drops of ammonia water. On shaking, a purple color develops; its intensity is an index to the degree of acetonemia. The writer would select this test if he were limited to 1 quick method in the prognosis of diabetic coma.

INORGANIC CONSTITUENTS.—
CHLORIDES.—A series of conditions has lately come to light in which the chloride content of the blood is definitely diminished (hypochloridemia). O. L. V. De Wesselow (Intern. Clin., Sept., 1924) divides them into Group 1: Vomiting from intestinal or pyloric obstruction, uremia or pregnancy, and Group 2: Such conditions as pneumonia, war-gas poisoning and extensive superficial

In obstruction the explanation is still in doubt. In uremia the base left after vomiting of the HCl is used to neutralize excess of phosphoric acid; the vomiting may thus be a protective mechanism. In vomiting of pregnancy, the plasma chlorides apparently being low, a similar protection against ketone acids and reduced alkaline reserve may be afforded. In pneumonia chlorides pass into the consolidating lung, while in extensive burns much sodium chloride is lost with the inflammatory exudate. It seems wise to urge water and salt on patients with extensive burns and shock. In Group 1 the blood chlorides can be raised by hydrochloric acid or, preferably, ammonium chloride.

CALCIUM.—Addition of decalcifying agents such as sodium citrate to normal blood was found by Colebrook and Storer (Brit. Jour. of Exp. Path., Apr., 1924) greatly to reduce its power to kill staphylococci and streptococci. They ascribe this to interference with some of the functions of the leukocytes. In the therapeutic procedure known as immunotransfusion, citrated blood should, on this account, not be used.

According to W. H. Jansen (Deut. Arch. f. klin. Med., Oct., 1924), the temporary increase of blood calcium produced by ingestion or injection of large doses of certain calcium salts—1 to 1.5 Gm. (15 to 22½ grains)—is more marked with calcium bicarbonate than with calcium chloride. Calcium lactate by the mouth caused no perceptible increase in the blood calcium. R. Lévy (Ann de méd., Feb., 1923) finds that in nephritis and pleurisy, in which salt balance is not normal, calcium chloride, as well as potassium chloride, pass rapidly into the tissue fluids.

ACID-BASE EQUILIBRIUM .- Increased alkalinity of the blood in children was observed by Macciotta (Pediatr., June 15, 1924) after injections of pituitary preparations, particularly those made from the posterior lobe. On the other hand, adrenalin and, more markedly, thyroid extracts reduced the alkalinity. Cluzet and Kofmann (C. r. Soc. de biol., Oct. 31, 1924) noted a slight, temporary increase of alkalinity in the plasma and serum of animals exposed to moderate or large doses of X-rays; this effect was not reproduced in vitro. In anemias Odaira (Tohoku Jour. of Exp. Med., June 30, 1923) observed acidosis where the red cell count was below 3 millions.

According to György (Schweiz, med. Woch., May 1, 1924), metabolism exhibits a tendency toward the alkaline side at high altitudes. There is decreased elimination of acids in the urine, and forced respirations bring on spasms more readily than at low levels.

Myers, Schmitz and Booher (Jour. of Biol. Chem., Aug., 1923) have described a microcolorimetric method whereby the hydrogen ion concentration of the blood can be determined in 10 minutes.

ALKALOSIS .- This condition is believed by Kast, Myers and Schmitz (Jour. Amer. Med. Assoc., June 7, 1924) to be a common one. In spite of the chemical mechanism provided for keeping the blood at a constant slightly alkaline reaction (pH about 7.4), uncompensated conditions do occur, not only in disease but also in normal persons as a result of altered pulmonary ventilation or exercise. The acid-base balance may be most easily ascertained by estimating the hydrogen ion concentration (pH) and carbon dioxide content of the same sample of blood plasma; for the former, the method of Myers, Schmitz and Booher is available, and for the latter, the gasometric method of Van Slyke (Jour. of Biol. Chem., Nov., 1921). Not infrequently, alkalosis appears to have been mistaken for acidosis, leading to alkali therapy, which aggravated the condition. [See also separate article: ALKALOSIS].

**BLOOD-PRESSURE.**—According to 14,934 blood-pressure tests performed by W. C. Alvarez (Arch. of Int. Med., July, 1923) in university students, the pressure does not uniformly increase with age. In men the average pressure actually declines from the ages of 17 to 21 years in males and from 17 to 25 in Thereafter, it remains about the same in men until after 50 years, whereas in women it rises rapidly after 25 years and very rapidly after 40. While the pressure in young women averages 10 mm. Hg or more below that in young

men, in women after 45 it averages higher than in the men. tension was noted very often among the male students, 22 per cent. of whom showed pressures exceeding 140 mm., and 45 per cent., pressures above 130 mm. In women the corresponding percentages were 3 and 12. The palpatory method was used in these tests. J. T. Peters (Nederl. Tijd. v. Geneesk., Nov. 3, 1923) asserts that the normal limits of systolic pressure after the 20th year range between the sum of 90 plus 1/2 the age to 130 plus 1/2 the age (auscultatory method). At 60 years in men, however, there occurs an abrupt rise from 140 to 145 mm., then a gradual increase to 150 mm. at 70 years. In women, he finds, the pressure dips somewhat between the ages of 30 and 50.

The best information as to existing circulatory conditions is obtained, according to L. Roemheld (Münch. med. Woch., Aug. 3, 1923), by determining the blood-pressure in the morning before rising from bed. A pressure nearly normal at this time points to any high pressure at other times as being probably of the functional type.

A study by R. D. Gillespie (Jour. of Physiol., May, 1924) showed that mental work causes an increase of blood-pressure and pulse rate, independently of emotional factors. In combined mental and muscular work the increases in pressure and pulse rate are generally greater than in mental or muscular work performed singly.

J. C. Bramwell, A. C. Downing and A. V. Hill (Heart, Oct. 30, 1923) find that at low diastolic pressures a

very considerable output is attained for quite a small pulse pressure, while at high diastolic pressures the output remains small for very high pulse pressures. It is thus impossible for a person with a high diastolic pressure to attain a considerable output without developing a dangerously high pulse pressure and throwing an enormous strain on the heart.

HYPERTENSION.—Essential hypertension is to be considered, according to E. Kylin (Klin. Woch., Nov. 5, 1923), as a manifestation of disorder of the vegetative nervous system, probably secondary to defective endocrin functioning. There are various features of the condition which lend support to this view. Thus, there is a marked instability of the blood-pressure, with extensive daily variations and great reductions upon rest in bed. Most cases also have a low carbohydrate tolerance, sometimes passing into diabetes. There are changes in the leukocytic picture (increase of mononuclears and eosinophiles) suggesting a vegetative neurosis. The blood sugar curve upon injection of adrenalin is flattened, and the pressure response is abnormally slight. There are analogies with bronchial asthma (the cosinophilia, adrenalin response, familial tendency), with which the condition is frequently combined. Seemingly, slight stimuli, ordinarily inconsequential, are capable in this vegetative neurosis of causing abnormally great rises of blood-pressure by exciting vasoconstriction. The disturbance often occurs in association with the climacteric.

In 20 cases of essential hyper-

tension, with pressures of 180 mm. or over, J. Mannaberg (Wien. klin. Woch., Mar. 1, 1924) found the basal metabolism regularly increased from + 13.3 to + 54.9 per cent. Of nephritic cases of high pressure, only a portion had a high metabolic rate, while in 2 cases of syphilitic aortitis the rate was normal. M. Händel (Zeit. f. klin. Med., Oct. 25, 1924) similarly found the rate often increased in essential hypertension and nearly normal in nephritic hypertension. F. Kauffmann (Ibid.) observed that the former cases are incommoded by heat, whereas the nephritics are fond of it. In most of the essential cases the blood-pressure showed a paradoxic rise in a warm room, while in some nephritics it showed a decrease.

As symptomatic manifestations in 48 cases of essential hypertension Kauffmann (Münch. med. Woch., Sept. 5, 1924) was more especially impressed with morning headache, migraine after adolescence, dizziness and rheumatic pains mainly attending changes in the weather, lassitude (sometimes confined to 1 limb), discomfort in high temperatures, and occasionally palpitations.

ETIOLOGY AND PATHOGENESIS.

In a study of the relationship of

—In a study of the relationship of protein food to high blood-pressure, S. Strouse and S. R. Kelman (Arch. of Int. Med., Feb., 1923) obtained negative results. In progressive nephritis with high pressure, reduction of protein intake sufficient to reduce the non-protein nitrogen and urea in the blood did not lower the pressure. In hypertension with slight or no renal impairment, the marked variations in pressure observed bore no relation to

the intake of protein food, and no damage to renal function nor increase of nonprotein nitrogen or urea of the blood was found to follow protein feeding up to 150 Gm. daily.

H. O. Mosenthal and J. J. Short (Amer. Jour. Med. Sci., Apr., 1923) agree that protein foods do not increase blood-pressure. Starchy foods may increase it indirectly by bringing on obesity. There is no definite evidence in the literature that sodium chloride raises blood-pressure. The level of the blood chlorides bears no relation to blood-pressure. Ingestion of 10 Gm. of salt failed to raise the pressure in cases of hypertension.

Lian and Barrieu (Bull, Soc. méd. des hôp. de Paris, July 25, 1924) regard chronic hypertension as due to functional disturbance of the sympathetic system and endocrins, this disturbance being generally the result, in turn, of a general disease. If the kidneys are included in the disturbance, the blood-pressure is thereby further increased. Similarly, A. Faber (Ugeskr. f. Laeger, Feb. 21, 1924) believes hypertension a chemically produced effect of endocrin disease or disturbance. Evidence tends to show that the condition is initiated in or near the pituitary body. If there is a widespread impairment of endocrin functions, however, the pressure is, as a rule, very low. Nephritis, as well as chronic gonad disease in women, may likewise cause a chemical hypertension. Indeed, a rise of blood-pressure is 1 of the earliest signs of the impending climacteric. The menopause was the cause of the high pressure in 47 per cent. of 130 women examined. Effectual treatment of mild obesity by

diet in 297 cases led to a definite reduction of blood-pressure in 37 per cent. of the men and 38 per cent. of the women.

That the quanidin bases, compounds included in the "nonprotein nitrogen" of the blood, exert a powerful pressor effect is pointed out by R. H. Major (Jour. Amer. Med. Assoc., July 12, 1924). In dogs the blood-pressure was often doubled or even tripled within a few minutes after injections of methylguanidin sulphate, and the rise of pressure often persisted for 4 to 5 hours. This effect was promptly annulled by slow intravenous injection of a solution of calcium, potassium and ammonium chlorides or of normal hydrochloric acid. Uranium nitrate nephritis in dogs caused a gradual permanent decrease in the output of the guanidin bases. While normal persons and afebrile patients with normal blood-pressure showed an average daily excretion of 100 mgm. of guanidin bases, patients with high blood-pressure, whether of the essential or the nephritic type, showed a decreased output of these bases. Kidneys damaged by chronic nephritis, or slightly so by arteriosclerosis or a small vessel sclerosis, might be unable properly to excrete these substances, with resulting elevation of blood-pressure.

From blood-pressure studies in chronic retention of urine, Oppenheimer (Zeit. f. Urol., xviii, 129, 1924) concludes that the pressure may be reflexly increased as a result of pressure in the bladder, e.g., from spasm of the organ. The renal arterioles apparently may be the starting-point of the reflex. Experimental overdistention of the renal

pelvis causes a rise of blood-pressure. The reflex effect on the pressure is more pronounced in infected than in aseptic cases.

Chronic intermittent hypertension, according to L. Hahn (Zent. f. inn. Med., Jan. 3, 1925), is the adult and senile manifestation of a vascular neurosis. Pronounced pressure variations during the day are revealed by blood-pressure readings every 20 minutes. In the daytime the normal range of variations is 15 mm. Hg, while at night a reduction of pressure by not over 25 mm. may be considered normal.

TREATMENT.—Opinions differ as regards the treatment of high bloodpressure by salt restriction. According to J. P. O'Hare and W. G. Walker (Arch. of Int. Med., Aug., 1923), there is no good foundation for this measure, except in cases with nephritis retention and consequent decreased viscosity of the blood. Studies with the extremely low salt intake-reduction to 0.5 instead of 2 Gm. a day-which has been claimed more efficient by some did not indicate any special advantage over the older, less rigid restriction. very low salt intake is difficult to carry out at home and is monotonous and expensive. The writers find it hard to understand the comparatively low blood-pressure of subacute and chronic nephritis with edema, which nevertheless show the greatest retention of salt. F. M. Allen (Boston Med. and Surg. Jour., Nov. 22, 1923) objects to the conclusions of the preceding authors, and maintains that their work really supports the value of the strict, as opposed to the lax, limitation of

chlorides, especially in the more severe cases.

E. G. B. Calvert and S. W. Lane (Pract., Sept., 1924), from clinical tests, concluded that the salt consumed exerts an appreciable and sometimes a marked influence on blood-pressure. Even in normal persons, a decided increase or decrease of salt intake tends to produce. respectively, a rise or fall in pressure. The writers are convinced of the efficacy of salt restriction in hyperpiesis without renal damage. In chronic interstitial nephritis it is of some benefit. In patients without edema the benefit appears to vary with the degree of impairment of excretion. The salt ration should be kept at not over 2 to 4 Gm. for several weeks. G. Singer (Med. Klin., Mar. 31, 1923) orders salt restriction at intervals, with substitution of bromides.

Salt restriction is also favored by J. J. Selman (Ohio State Med. Jour., Dec., 1923), who observed a reduction of pressure to normal in 6 out of 10 cases thus treated. The salt taken should be less than 0.5 Gm. a day. In 3 cases high pressure, headache and dizziness returned when salt in moderate amounts was resumed. Even where the pressure is not reduced to normal, salt restriction relieves symptoms and avoids the danger of apoplexy.

According to E. S. Weiler (Rev. med. del Rosario, xiv, 343, 1924), in some cases hypertension is due to retention of carbohydrates, and the treatment indicated is carbohydrate restriction. Such a condition is discovered and traced by tests of the action of carbohydrate restriction on

the blood sugar. W. W. Herrick (Jour. Amer. Med. Assoc., Dec. 8, 1923) states that hyperglycemia exists in 10 to 30 per cent. of cases of hypertension, and recognizes a group of cases featured by the combination hypertension, hyperglycemia, obesity and arteriosclerosis. All of his 6 cases had been following a meat-free diet and therefore consumed an excess of carbohydrates. The treatment consisted of avoidance of undue fatigue and effort, and a diet yielding about 1600 calories and consisting of protein, 85 Gm.; carbohydrate, 125 Gm., and fat, 80 Gm. Usually the patient was allowed to "break training" as regards the diet for 1 or 2 days at 5 or 10day intervals. At times, to promote weight loss, a limited milk diet was enforced every 5th or 7th day. All the patients lost weight, the systolic diastolic pressures declined (about 25 to 50 mm, systolic), and the cardiovascular symptoms improved. Reduction of blood sugar and its maintenance at or about normal was constantly followed by reduction in blood-pressure.

In 14 cases reported by W. L. T. Addison (Can. Med. Assoc. Jour., Nov., 1924), pronounced pressure reduction followed the giving of 3 drams (12 Gm.) of calcium chloride daily.

E. Kylin (Klin. Woch., Sept. 16, 1924) confirmed the fact reported by Jansen that in essential hypertension the blood calcium is low. He obtains good results in treatment by giving calcium chloride, 1 Gm. (15 grains), and atropine sulphate, 0.25 mgm. (½60 grain), 4 times daily. Under this treatment the atypical

response to adrenalin in these cases returns to normal.

In the arterial spasms of essential hypertension as well as angina pectoris, Meyer (Schweiz, Arch. f. Neur. u. Psych., xiii, 440, 1923) advocates intravenous injection of 10 c.c. of 20 per cent. glucose solution. In about ½ hour the blood-pressure is reduced, and in some cases it remains low for several days.

Sodium nitrite intravenously has been recommended of late. Petzetakis (C. r. Soc. de biol., Dec. 27, 1924) gives successive amounts of 0.005, 0.01, 0.02, and at times 0.03 or 0.04 Gm.  $(\frac{1}{12}, \frac{1}{6}, \frac{1}{3}, \frac{1}{2})$  or  $\frac{2}{3}$ grain), in a 1 per cent. solution, in series of 15 injections, at first daily, then at 2 or 3-day intervals, and reports gratifying results. A. Torday (Orvosi hetil., Aug. 3, 1924) employed similar doses in 9 cases, and noted reduction of blood-pressure, relief from anginal attacks for a month, and sometimes relief from asthmatic attacks. He notes that Nagy has also advocated intramuscular administration of sodium nitrite in these conditions as well as in intermittent claudication.

In males over 40 years of age F. Kisch (Wien. klin. Woch., Feb. 22, 1923) has observed very commonly a "cardiac-intestinal syndrome" characterized by hypertension, constipation, gaseous accumulation which compresses the heart into a more transverse position, precordial oppression, intermittences and an anginal tendency. Even in the absence of constipation, the treatment consists of systematic saline purgation with a carbonated alkaline-saline mineral water, sadium sulphate or

artificial Carlsbad salts. Such therapy is also useful in cerebral, coronary and peripheral arteriosclerosis

C. E. de M. Sajous (Amer. Med., June, 1923) lays stress on the lecithin of the adrenal cortex as a bloodpressure-raising factor. As a rule, however, the cause of hypertension in endocrin cases is toxic wastes due to inadequate katabolism. In hypothyroidism with hypertension, thyroid gland restores the equilibrium. In the hypertension of the menopause, the same product, with ovarian gland and corpus luteum, is helpful. In the high pressure frequently attending hyperthyroidism the cause is usually a focal infection—cecal, tonsillar, dental, etc.—after removal of which the pressure recedes. salicylates, ergotin and quinine hydrobromide also give good results in Grober (Münch. med. such cases. Woch., Feb. 8, 1924) reports favorably on thyroid gland in small doses in high blood-pressure. In the "malignant" form of essential hypertension, the result of complicating hyperthyroidism, A. Sophian (Jour. Mo. State Med. Assoc., Apr., 1924) advocates the treatment customary in thyrotoxicosis. In 1 case there was manifest response to X-ray treatment of the thyroid.

In a comparative study of potassium iodide, erythrol tetranitrate and guipsine (a French preparation of the mistletoe, Viscum album), H. J. Vetlesen (Norsk Mag. f. Laeg., Feb., 1924) found their relative efficacy to correspond to the order already given. Their alternate use, however, gave good results in arteriosclerosis with dizziness, dyspnea, oppression and angina pectoris.

Injections of 0.02 to 0.04 Gm. (1/3 to 2/3 grain) of sulphur are claimed by S. Rusznyak (Orvosi hetil., Aug. 19, 1923) to have markedly lowered the pressure in 13 cases of arteriosclerosis or nephritis. Favorable results were noted in a few cases of angina pectoris, polycythemia and uremia.

F. R. Barnes (Boston Med. and Surg. Jour., Aug. 14, 1924) has observed a definite relation between tinnitus aurium and precordial distress in hypertension and the pulse pressure. The only serviceable treatment for these symptoms proved to be rest in bed. The patient, however, gradually becomes accustomed to the tinnitus.

According to R. Wilson, Jr. (Jour. So. Car. Med. Assoc., Sept., 1923) there is danger of cerebral hemorrhage in hypertension only in the presence of miliary aneurisms of the internal capsular arteries. The only clinical evidences of such arterial disease are premonitory symptoms such as attacks of vertigo, numbness, tingling in the hands, transient aphasia or paralysis. Examination of the retina may be useful. The main factors in the treatment are mental quiet, physical rest and moderation in diet.

Hypertension secondary to syphilis generally appears at a late period after infection, but in a case reported by Brouardel, Giroux and Bonnot (Paris méd., Aug. 25, 1923) it appeared in the secondary stage. The blood-pressure was markedly reduced by mercury and bismuth. A. Dumas (Ibid., July 5, 1924), in the earlier stage of syphilitic arterial disease with high pressure, advocates arsphenamin in alternation with

mercury cyanide to forestall the more advanced and refractory condition of hypertrophic mesarteritis. Later, if there is heart weakness, the cyanide alone should be employed.

In the average case of hypertension E. M. Brockbank (Lancet, Oct. 20, 1923) finds iodine, particularly in oily or albuminoid combination or in colloidal form, frequently very effective. In all cases with anginal pain, shortness of breath, dilated heart and gallop rhythm digitalis is indicated. In a number of cases, including some of angina pectoris with hypertension and cardiac overstrain, diathermy gave persistent symptomatic relief and reduction of blood-pressure. Hediger (Klin. Woch., July 2, 1923) recommends carbon dioxide baths.

According to B. L. Knight (Jour. of Radiol., July, 1924), in hypertension due to arteriosclerosis, meat may be allowed provided it has been put on the stove in cold water and slowly brought to a boil. Daily small amounts of thyroid extract are frequently helpful. The nitrites should be reserved for urgent cases, e.g., after a hemorrhage. After a stroke, autocondensation may be used, but only with a current of 300 ma. for 10 minutes at the 1st treatment, to be later gradually increased. In hyperpiesis, without renal disturbance other than loss of the reserve power of the kidneys, the plate method of autocondensation, with 2000 ma, used daily, is available, but in actual nephritis this procedure is contraindicated.

Every case of hypertension being one of potential nephritis, D. R. Black (Jour. Mo. State Med. Assoc., Sept., 1923) attributes importance to kidney function tests in the study of these cases. Distinct elevations in

blood urea nearly always mean renal involvement, and an increase of creatinin is of grave portent. Almost all of the writer's cases harbored foci of infection, removal of which resulted in definite blood-pressure reduction. In obese patients, restriction to a low caloric diet led to a pressure reduction nearly commensurate with the weight lost.

R. M. Goepp (Ann. of Clin. Med., July, 1923) advocates occasional periods of absolute rest in bed on a restricted diet. If constipation, flatulence and indicanuria are prominent, colonic irrigation may prove useful. Warm baths and electric baths are serviceable. In the arteriosclerotic, especially in aortitis, occasional courses of mercury and sodium iodide combined with sparteine or digitalis were found quite helpful. Digitalis, however, is not always well tolerated.

In the cerebrorenal type of hypertension, with a pressure ratio of 180 to 240/120 to 150, nycturia with fixation of specific gravity toward lower levels, albumin and casts, and nitrogen retention, W. J. Stone (Cal. State Jour. of Med., Dec., 1923) advises a basic alkali diet, with moderate restriction of salt, coffee, and the limitation of tobacco. The endocrin functions and basal metabolic rate should be investigated. Reasonable rest and freedom from worry while continuing work and play in moderation are indicated. Sodium phosphate or magnesium sulphate is best for bowel elimination. The cabinet bath, once or twice weekly, is useful. Benzyl benzoate is valuable to prevent anginal or cerebral crises. Certain acute symptoms, especially in the plethoric obese, may be relieved by venesection. For threatened cerebral hemorrhage E. S. du Bray (Amer. Jour. Med. Sci., May, 1924) employs complete rest, an ice-cap, vasodilators, sedatives, and possibly lumbar puncture.

According to E. S. Smith (Ann. of Clin. Med., May, 1924), digitalis often lowers the blood-pressure in hypertensive cardiovascular-renal disease through the increased elimination by diuresis. The theobromine group of diuretics act similarly. A search for ductless gland influences should be made.

HYPOTENSION.—Most writers. place the systolic pressure in hypotension at a maximum of 110 mm. Hg in adults (auscultatory method). A. Friedlander (Jour. Amer. Med. Assoc., July 19, 1924) deems it certain that distinct hypotension is compatible with perfect health. Many hypotensive subjects have great bodily vigor. Indeed, most life insurance medical directors are convinced that hypotension in apparently healthy persons in middle life adds to the life expectancy. Persistent low blood-pressure occurs with certain chronic diseases, chronic infections, cachectic states, infantilism, myasthenia gravis, status lymphaticus and certain circulatory lesions. The real nature of "essential hypotension" is not yet understood; in some cases low-grade focal infections seem responsible. Hypotension also occurs in endocrin disturbances, especially of the suprarenals, hypophysis and thyroid. Hoxie emphasizes a parallelism between vasomotor tone and the integrity of the sex glands. Histamin and other vasodilators are constantly produced in the body, and considerable evidence is at hand to the effect that persistent hypotension

in many conditions may be due to poisoning and dilatation of the capillaries by such substances. According to Cannon, the action of histamin typefies that of a large class of poisonous protein derivatives—products of partial digestion, of bacterial action and of tissue extraction.

L. A. Levison (Ohio State Med. Jour., Sept., 1924) found the symptoms in patients with pressures below 100 mm. very diverse and variable. The most important were exhaustion, inability to do prolonged or constant mental or physical work, restlessness, headaches, listlessness or apathy and digestive disturbances. The vital capacity and renal functional tests did not depart greatly from the normal. Readings below 80 are very uncommon, but are occasionally met with without a correspondingly advanced list of symptoms.

TREATMENT.—The management of hypotension cases is often rendered unsatisfactory, according to Levison, by the fact that one is dealing with constitutional inferiorities not amenable to ordinary measures. An effort should be made to adjust the patients' level of living to their physical and mental capabilities.

D. Riesman (Atlantic Med. Jour., May, 1924) states that in constitutional hypotension a general making-over of the patient is required. Exercise, especially mountain climbing, massage, a sea voyage, and tonic medication are usually beneficial. Removal of all depressing factors and focal infections is necessary. Pal (Med. Klin., Mar. 31, 1923) notes that pituitary preparations, particularly if given in conjunction with adrenalin, exert a more permanent

hypertensive effect than the latter drug given alone.

BONES.—Proper acid-base balance is emphasized by Blum, Delaville and Van Caulaert (C. r. Soc. de biol., Jan. 30, 1925) as an important factor in the normal development and maintenance of the bones. Normally, the bases predominate over the acids. In the developmental period ossification is arrested by acidosis, as in rickets, while in developed bones acidosis induces decalcification, as in osteomalacia and the acidosis of diabetes and of pregnancy.

W. Engelbach and A. McMahon (Radiol., June, 1924) report an elaborate X-ray study, covering over 2000 cases, of the influence of endocrin disorders on bone development. They find that X-ray examination may be of even greater diagnostic value than the basal metabolism, blood chemistry and other procedures. In uncomplicated hypothyroidism retarded development of all bones is demonstrable. Cases of hypogonadism and eunuchoidism show consistently a late fusion of the epiphyseal ends of the long bones; these bones are overgrown, because of anterior pituitary activity. In anterior pituitary deficiency, on the other hand, with secondary gonad deficiency, the late epiphyseal closure is accompanied by undergrowth of the long bones. In thyropituitary disorder there is advance of carpal and long bone nuclei development over that of pure hypothyroidism, while in pituitary thyroidism there is retardation of the osseous nuclei and epiphyseal fusions. In the less frequent but instructive pubertas praecox (suspected pinealism), there is a most unusual advancement of the bone nuclei and epiphyseal fusions—a picture exactly opposite to that found in hypogonadism. The few cases of thymolymphatism studied showed much the same osseous retardation as mild hypothyroidism.

**DEFORMITY.**—In preference to osteoclasis or open osteotomy for bone deformity, Kirschner (Arch. f. klin. Chir., cxxvi, 523, 1923) adopts the following redressement procedure: After exposure of the bone by a longitudinal incision, any nerves or vessels in contact with it are retracted or ligated and the bone then partially split by numerous impacts of a chisel placed longitudinally over it at various points. If necessary the chisel may be turned in the separate fissures made in order to force them open slightly. When the bone has been thus sufficiently weakened to permit of its being placed (after closure of the wound) in a corrective position, either manually or with apparatus, a plaster cast is applied and allowed to remain until consolidation is nearly complete, when it is removed for any further correction that may be required.

FRAGILITAS OSSIUM.—In a case of fragilitas ossium (idiopathic osteopsathyrosis) observed by G. W. Wagoner (Ann. of Surg., July, 1924) in a negro of 38 years, tests showed that the calcium and phosphorus of the blood plasma and bone, and likewise the magnesium of the bone, were normal. The basal metabolism was increased, with marked exophthalmos, a palpable thyroid, immature genitalia, shallow pituitary fossa, slight tachycardia, blue scleræ and impaired hearing. No history of syphilitic infection or bone disease in the family could be obtained. Amputation of a leg became necessary, and the tibia showed a broken and thinned cortex with distended Haversian canals and increased bone resorption.

**GRAFTS.**—Attention is being directed to the fact that the result in bone transplantation varies according to the place in which the transplant is inserted. L. Imbert (Bull. de l'Acad. de méd., Oct. 16, 1923) states that whereas a transplant inserted in a gap in a resected bone participates in callus formation and remains, a like transplant inserted elsewhere is absorbed. Polettini (Arch. ital. di chir., Apr., 1923) found that while grafts implanted in the backs of rabbits did not form bone or cartilage, implantation of scraps of cartilage, bone or aorta under the skin of the ear was followed by growth of bone or cartilage in a large number of instances.

Out of 29 grafts for simple ununited fractures, N. T. Kirk (Jour. of Bone and Joint Surg., Oct., 1924) obtained a successful result in 27, while out of 129 cases following war wounds or other compound fractures with severe infection, 76 were successful. The types of grafts proving successful included: Inlay, 78 cases; intramedullary, 17; osteoperiosteal, 5; peg (not intramedullary), 2, and transplant, 1. Those proving unsuccessful were: Inlays, 37; intramedullary, 15, and osteoperiosteal, 2.

In procuring an intramedullary implant from a fractured bone, W. R. Adams (Surg., Gyn. and Obst., Jan., 1923) cuts it out with a twin saw, including the endosteum and periosteum, to a width exactly that of the medullary canal into which it is to enter. It is made about 4 or 5

inches long, cut at least 2 inches away from the fracture, and made blunt at 1 end and pointed at the other with a single saw. It is pushed, with the pointed end first, into the medullary canal until 2 or 3 inches of it lie below and the same length above the fracture, thus bridging the lesion and holding the bone fragments firmly in good position.

According to L. Christophe (Arch: franco-belges de chir., Jan., 1923), bone grafts placed promptly in alcohol and used soon after constitute ideal material for the purpose. Like living bone transplants, they are either well borne and heal where inserted, or are absorbed (more slowly than living transplants), whereupon new bone is formed from their constituent materials. In a case of shattered patella from a war wound, a patella from another soldier, after being kept in alcohol for 3 days, was implanted 4 months after the injury, with excellent functional results.

Where a portion of the *tibia* has been removed because of crushing injury or osteomyelitis, D. Fieschi (Chi. d. org. di mov., Mar., 1924) recommends a shifting of the fibula into juxtaposition with the stump of the tibia above and below. Differences in the growth of the 2 limbs may occur in young patients, but such differences are never great enough to be of practical moment. The shifted fibula gains in thickness and strength to compensate for the lost tibia.

SYPHILIS.—B. Dujardin (Arch. franco-belges de chir., Aug., 1923) recognizes among the syphilitic bone lesions a tertiary or allergic parasyphilitic group, in which there is hypersensitiveness not only to spirochetal toxins but also to other toxins, tuberculin and even ordinary materials such as milk. Skin tests may lead, under these circumstances, to an erroneous diagnosis. Under specific treatment the allergy as a whole subsides, and with it disappear com-

plicating conditions, as in a case cited of osteitis of the tibia yielding tubercle bacilli, from which recovery rapidly took place under antisyphilitic treatment.

TENDER POINTS.—A number of typical tender bone points, attended with pain that may be confused clinically with a variety of local disorders, are described by R. Bastianelli (N. Y. Med. Jour., Feb. 7, 1923). The tender spot is well circumscribed, so that it can be found with the edge of the nail. The pain radiates to a distance, may be accentuated during certain movements, and may be constant though variable, occur at intervals or appear in attacks of a neuralgic character. The pain may be dull, boring or tearing, is commonly worse at night, may disable a limb or completely prevent work, and often lasts for years.

Among the tender bone points referred to are the following: (1) A point at the anterior border of the deltoid, near the pectoral-deltoid interstice, below and slightly outside the coracoid process. It is actually situated just outside the capsular insertion, near the dividing line between the lesser tuberosity and anatomical neck of the humerus. The absence of shoulder atrophy and the free mobility of the joint except for outward and backward rotation are diagnostic. (2) The tip of the styloid process of the radius, usually with pain during ulnar and dorsal flexion of the hand, abduction of the thumb, or grasping or raising a weight. (3)  $\Lambda$ limited spot on the epicondyle just at its anterior point. (4) The styloid process of the ulna. (5) The bases of the 1st and 2d metacarpals. (6) The pisiform bone. (7) A point on the internal tibial condyle, anteriorly, about midway between the middle and internal lines of the knee, and exactly on the infraglenoid margin. (8) The head of the fibula. (9) The external tibial and femoral (10) The margin of the condyles. patella. (11) The apex of the malleoli. (12) The inner side of the navicular bone. (13) The dorsal aspect of the bases of the 2d and 3d metatarsals. (14) The plantar surface of the head of the 4th and 3d metatarsals. (15) The posterior and inferior surfaces of the os calcis. (16) The 4th and 5th ribs, posteriorly between the scapula and spine, associated with tender scapular spots and indefinite brachyalgia. (17) The inferior costal margin. (18) The tips of the 11th and 12th ribs. (19) Various points on the spinal column, in particular the spine of the 7th cervical. (20) The sacral region. (21) The posterior iliac spine close to the sacroiliac joint. (22) The tip of the coccyx. (23) The tip of the lateral process of the 3d lumbar vertebra, with pain located vaguely in the back and spreading along the waist to the iliac fossa, usually idiopathic though at times ascribable to exertion or rheumatism. (24) A point elicited by deep pressure against the lateral surface of the body of the 4th lumbar vertebra. These tender and painful points have often misled observers into diagnoses of disease of the viscera.

The treatment, which is usually very effective, consists of the injection of 10 to 20 minims (0.6 to 1.2 c.c.) of 3 to 5 per cent. phenol solution deeply on the bone exactly at the painful point. This is repeated 4 or 5 times at different intervals, according to the reaction. In acute forms the writer generally waits for

subsidence before starting the injections; otherwise the reaction is more severe.

TUBERCULOSIS.— DIAGNOSIS. —The results of tuberculin tests in 200 cases of presumably tuberculous bone and joint diseases in children are recorded by R. Egaña (Semana med., June 28, 1923). Positive reactions were obtained in all but 7 cases, with the following percentages: Skin test, 93.03 per cent.; intradermal test, 75.25; ophthalmic, 33.15, and the Moro percutaneous inunction test, 56.72. Of the 7 negative cases, 5 were shown to be non-tuberculous hip conditions by the subsequent course, while in 2 the negative results were ascribed to advanced cachexia.

In spite of X-ray examination, guineapig inoculations and histologic study, S. Johannson (Svenska Läk. Handl., June 30, 1924) frequently deems the diagnosis merely presumptive. Study of the sedimentation of the red cells is of greater service in ascertaining the degree of activity and intensity of the tuberculous process than for differential purposes.

PROGNOSIS.—In surgical tuber-culosis operations should be post-poned, according to Geldmacher (Deut. Zeit. f. Chir., Oct., 1924), until the *Weiss urochromogen reaction* is and remains negative. This test is performed by adding 1 to 3 drops of a 0.01 per cent. solution of potassium permanganate to 15 c.c. of the patient's urine. The positive response is marked by a definite canary yellow color appearing in 5 minutes. If it continues positive, a grave form of the disease is indicated.

TREATMENT.—Modern treatment by the use of rest, food and weather, if started in good time and kept up long enough, will, according to Girdlestone (Brit. Med. Jour., June 14, 1924), almost always bring about a cure—to be made permanent by skilled after-care. Such treatment, however, calls for a special open-air hospital and an experienced staff. There are many advantages in not transplanting a patient from his home climate to a distant hospital. Rest, heliotherapy, tuberculin and general hygiene are deemed by W. A. Clark (Jour. of Bone and Joint Surg., Oct., 1923) the procedures of greatest importance in bone and joint tuberculosis in children. using tuberculin, he begins with ½20,000 mgm. of B. F. (bouillon filtrate) subcutaneously and increases up to  $\frac{1}{100}$  mgm. in about 3 months. Heliotherapy in addition shortens the course of the disease and improves the general condition.

In multiple bone tuberculosis, as well as in spondylitis with abscesses and sinuses, Hotz (Zent. f. Chir., Apr. 19, 1924) advocates intramuscular injections of 1 to 4 c.c. (16 to 64 minims) of a solution consisting of 9 parts of 10 per cent. iodoform in glycerin to 1 part of 10 per cent. tincture of iodine. These injections, preceded by 2 per cent. procaine locally to reduce the resulting pain, are repeated every 2 to 4 weeks. Some caution as to dosage is required; the pulse curve gives warning of danger in this connection. Frequently, salt baths, sun baths, X-ray treatment, and, if possible, a stay in a sunny, elevated region, are combined with the procedure. Under this treatment, few resections or amputations become necessary, though excision of isolated foci is commonly resorted to.

According to Oschmann (Arch. f. klin. Chir., Dec. 20, 1924), surgical tuberculosis is coupled with accumulation of acids in the system, which leads, in turn, to loss of calcium. He therefore administers calcium chloride, preferably by iontophoresis at the site of disease, whether this involve bone, a joint, or the skin (lupus). A carbon electrode should be used rather than one of copper.

Vaudremer (Presse méd., Oct 8, 1924) advocates vaccine therapy with a suspension of tubercle bacilli exposed to the action of Aspergillus fumigatus, so that ½ of the bacilli have been destroyed and the remainder attenuated. In some instances a single subdermal injection of 0.5 to 1 c.c. proved curative.

In tuberculosis of the knee-joint (white swelling) and of the bones of the hands and feet, K. Stettner (Deut. med. Woch., Feb. 29, 1924) reports uniformly good results from X-ray treatment combined with immobilization, massage and exercises. cachectic, emaciated patients X-rays should be preceded by a general strengthening treatment, as by heliotherapy, brine baths and tuberculin or other immunizing injections. The X-ray dosage should be cautious at first. The prognosis is favorable with the degree of allergy developed. In spina ventosa, tuberculous tendo-vaginitis or bursitis, rib involvement, and fungus or empyema of a marrow cavity, surgical procedures may advantageously be combined with the X-rays.

Saidman (Presse méd., July 2, 1924), in bone and joint tuberculosis, has used the ultra-violet rays in 200 cases, beginning with a 1-minute exposure to the mercury quartz lamp at a distance of 50 to 70 centimeters, and later increasing the time by 1

minute at each exposure and decreasing the distance progressively to 20 or 30 cm. Two or three treatments a week are given. When erythema appears, the dose is cut down ½, then later increased again up to the skin dose. The X-ray is also sometimes used for deep, localized effects and the infra-red rays to allay pain. Aside from bone and joint involvements, the procedure also proved very effective in adenitis, cold abscesses, skin involvements, involvements with sinuses, peritonitis and some cases of pleurisy.

According to Gundermann (Zent. f. Chir., Jan. 10, 1925), periarterial sympathectomy is an available procedure of last resort before surgical intervention, lasting improvement has occurred from it in some of his cases after failure of all other methods. The rationale of and precise indications for the procedure are not yet clear.

TUMORS.—Out of 1144 cases of malignant disease, C. A. Joll (Brit. Jour. of Surg., July, 1923) found bone metastases in 53. The vertebræ were involved in 21.6 per cent.; the ribs, 20.4 per cent.; sternum, 14.7; femur, 14.7; skull, 10.2; humerus, 7.9; pelvis, 4.5; tibia, 2.2; mandible, 1.1; scapula, 1.1, and clavicle, 1.1 per cent. In 34 of the 53 cases, the primary tumor was located in the breast.

DIAGNOSIS.—A correct diagnosis of bone tumor can be made, according to J. M. Hitzrot (N. Y. State Jour. of Med., Aug., 1924), only by combined consideration of the evidence from the history, clinical and X-ray examinations by consultation with the roentgenologist and pathologist. Often a pathologic examination of the growth itself is also necessary. The writer dissents, with

Coley, Bloodgood and Codman, from Ewing's view that the therapeutic test by radiation should be applied first. Both for diagnosis and treatment he advocates *en bloc* removal of the tumor-bearing bone in suitable cases. J. J. Morton and W. C. Duffy (Arch. of Surg., Nov., 1923) deem the clinical behavior of the tumor a most valuable diagnostic indication; in many cases the only true test is that of time.

L. Tavernier (Arch. franco-belges de chir., June, 1923) finds X-ray study sometimes more useful than histologic examination in differentiating bone malignancy from an ordinary mild inflammation. In sarcoma the X-ray impression is less one of multiple foci than in osteomyelitis, which usually exhibits light areas in the bone. Yet sarcoma does occasionally give an atypical picture as of multiple foci, to which was added in 3 of his cases hyperostosis simulating syphilis. Syphilis is excluded if there are small, irregular erosions of the anterior margin of the bone. That sarcoma may involve the whole femur without greatly increasing the thickness of the bone was illustrated in 1 of the writer's cases.

Diagnostically useful blood changes in metastatic bone tumors are described by A. Piney (Brit. Jour. of Surg., Apr., 1924). These changes are due to irritation of the marrow by the secondary deposits, and are classed as either pseudopernicious or pseudoleukemic. To distinguish the former type from actual pernicious anemia the occasional presence of a low color index is of value. To distinguish the pseudoleukemic type from leukemia, a valuable feature is the invariable absence of a marked

increase of basophile leukocytes in metastatic anemia, whereas such an increase is almost constant in leukemia. The presence of even a few basophile myelocytes is strong evidence of actual leukemia.

PROGNOSIS.—Of 50 cases of giant cell sarcoma of bones reviewed by W. B. Coley (Ann. of Surg., Mar. and Apr., 1924), 32 were still alive, and 7 were not traced, but 10 had died (including 9 from metastases) and 1 was in a hopeless condition. It seems necessary to modify the opinion strongly held by most pathologists that giant cell sarcoma is always benign and does not metastasize. The patient's limb was saved in 24 instances.

TREATMENT.—Discussing bone my.roma, J. C. Bloodgood (Ann. of Surg., Dec., 1924) states that this lesion is, for practical purposes, a sarcoma with a much greater tendency to recurrence from wound transplantation and a longer interval before death from metastasis. In 1 case of central myxoma of the femur, curettage and repeated cauterizations with plumber's soldering irons proved inadequate, recurrence taking place in a year, with a fatal ending. In another case, in which the nature of the growth was recognized from the history, palpation and X-ray examination, amputation was done without exploration, and the patient was still well 9 months later. This procedure, or resection without exploratory incision, has alone yielded permanent cures so far, though in a 3d case of the writer's the patient was still well 9 months after cauterization with soldering irons upon discovery of the myxoma at exploratory incision.

According to Mauclaire (Bull. de l'Acad. de méd., Nov. 25, 1924), autoplastic bone grafting is frequently successful in osteosarcoma of the radius, whereas grafts from other individuals seldom succeed. case of large myelogenous sarcoma of the tibia in a girl of 8 years, Riosalido (Arch. españ. de ped., July, 1923) performed resection and inserted a piece of tibia from the opposite limb to make good the defect. Three months later, upon removal of the plaster cast, union at both ends of the transplant was found to have occurred, and complete functional use of the limb was later recovered.

Recovery from a giant-cell sarcoma at the right iliac crest, which softened the entire ilium, under deep X-ray therapy is reported by H. Wachtel (Jour. de radiol. et d'électr., Dec., 1924). A series of 5 daily exposures, each of 25 minutes, was first given over the anterior aspect of the growth, and immediately after a similar series over the posterior aspect. The dosage was 2 skin units, with a current of 1.5 ma., 2 mm. aluminum filtration, and a focal distance of 24 cm. Ten days later, further treatment was given, and 10 skin units added for enlarged glands in the vicinity—a procedure repeated 2 months later. Under this treatment the tumor in 4 months was transformed into a benign osteoma. Marked general improvement occurred, and the recovery was still maintained 10 months later.

BOTULISM.—In an outbreak of botulism in Albany, Ore., reported by F. D. Stricker, W. Levin and R. L. Benson (Northwest Med., July,

1924), all of the 12 persons concerned died from the virulent toxin present in a jar of string beans. Great care must be exercised in the home canning of vegetables, with the use of sufficient heat to sterilize. The soil of the garden in which the beans had been grown was found to contain Claustridium botulinum, Type A. While the soils of the Southeastern states seem to be free of the germ, the spores were found in 31 per cent. of the soils examined from Oregon, 80 per cent. from Washington, and 29 per cent. from California. E. J. Easton and K. F. Meyer (Jour. of Inf. Dis., Aug., 1924) found the germ in over 50 per cent. of virgin soil specimens in California, and from this as well as evidence secured from an examination of 95 manure specimens, believe that animal excreta contribute little to soil pollution with this organism. It seems capable of multiplying in symbiotic relations with other anaërobes wherever protein material undergoes putrefaction.

C. C. Dozier (*Ibid.*, Aug., 1924) measured the inhibitive influence of sodium chloride and sugars on the growth of *B. botulinus* in double strength veal infusion. No growth occurred where the salt content exceeded 8 per cent. or the sucrose content 55 per cent. For actual destruction of the spores, exposure to 10 per cent. hydrochloric acid for an hour was required. If more time is allowable, liquor formaldehydi diluted once with warm water, acting at least 24 hours, is recommended.

## SYMPTOMS AND DIAGNOSIS.

—While some cases show early gastrointestinal disturbances, the outstanding feature, as noted by A. L. Cooper (Neb. State Jour. of Med., Oct., 1924), is a peripheral motor

paralysis, coming on in 12 to 36 hours and followed either by a fatal termination in a few hours to several days or by slow recovery.

In 2 cases reported by W. A. Pinkerton and J. Krobalski (Med. Jour. and Rec., Aug. 6, 1924), the initial symptoms, developing on the day after the victims had eaten some canned squash, consisted of malaise and loss of appetite, followed by vomiting and diarrhea, and later by weakness, diplopia, blurred vision and vertigo. There were also obstinate constipation, difficulty of speech, and dryness of the mouth and throat. On attempts to swallow, cyanosis appeared and the fluid regurgitated through the nose. The pupils were dilated and sluggish. The temperature was subnormal in 1 case and febrile in the other.

In 7 cases, with 5 deaths, traced to home-canned string beans and observed by J. E. Naugle (Colo. Med., June, 1924), diplopia proved the earliest symptom, while dry mouth, inability to expectorate, shortening of the tongue and difficulty in swallowing came on later.

External as well as internal ocular paralyses are stressed by A. Bär (Klin. Mon. f. Aug., July 5, 1924) in the diagnosis from such conditions as diphtheria, methyl alcohol or atropine poisoning, and bulbar paralysis. All of his 3 cases developed hyperemia of the nerve-head, followed by optic neuritis in 1 case and central scotoma and retinal hemorrhage in another.

According to C. W. Edmunds and G. F. Keiper (Jour. Amer. Med. Assoc., Aug. 16, 1924), there is no good evidence that the botulinus toxin acts on the central nervous system; their experiments point,

instead, to the peripheral nervous structures. In animals there was always a curare-like action on the motor nerveendings in the voluntary muscles. The vagus was also depressed or paralyzed. All the clinical symptoms of botulism, which are purely motor in character, may be thus explained. In frogs, furthermore, the peripheral effects resembled those of atropine. The vagus, as well as the oculomotor and chorda tympani nerves, probably undergoes some stimulation before the stage of paralysis, thus explaining the discrepancies in descriptions of cases of botulism. Botulinus antitoxin combined with protracted artificial respiration gave encouraging therapeutic results in dogs, but in man tracheotomy would be necessary for the continued artificial respiration. The toxin is neither destroyed nor neutralized easily, but retained in the blood for a long time.

The incubation period in the general type of food poisoning, according to J. C. Geiger (*Ibid.*, Oct. 13, 1923), is from about 3 to 12 hours, while that of botulinus intoxication is from 24 to 48 hours. In complaints of illness immediately or closely following a meal, a diagnosis of food poisoning should be made only after exhausting every other diagnostic possibility. The food responsible may have been consumed at a previous meal.

The possibility of obtaining bacteriologic evidence of botulism from the feces in cases in which specimens of the suspected food are unavailable is pointed out by M. W. Wheeler and E. M. Humphreys (Jour. of Inf. Dis., Sept., 1924), who were able to isolate the germ from the feces in a typical case. Blood-agar plates incubated in a hydrogen-anaërobic jar were found best for the purpose.

TREATMENT.—While early administration of botulinus antitoxin is desirable, such a procedure is made difficult by the fact that the disease

is usually not recognized within 48 hours. According to Edmunds and Keiper (loc. cit.), the serum apparently is protective, but inefficient if not given until the disease is clearly discernible. Time is required for the paralyzed nerve-ends in the respiratory muscles to recover, and this calls for prolonged artificial respiration. Administration of morphine will delay the course of the intoxication, allowing more time for the antitoxin to act.

According to J. J. Bronfenbrenner, M. J. Schlesinger and P. F. Orr (Jour. of Exp. Med., July, 1924), moreover, the antitoxin may not always be effective owing to the existence of a group of toxin-producing bacteria very similar to B. botulinus, but homologous immunologically with either of the known types of the latter. According to Bengtson (U. S. Pub. Health Serv., Hyg. Lab. Bull. 136, 1924), the dosage of antitoxin advised by the British Ministry of Health is 20 to 50 c.c., repeated daily if required. For preventive purposes, 10 c.c. intravenously may be given to persons who have consumed suspected food but not yet presented symptoms. Dickson and Howitt advise a preliminary skin test for hypersensitiveness, and a slow injection, not exceeding 1 c.c. per minute, even if the test is negative.

In the cases treated by Pinkerton and Krobalski (loc. cit.), the measures used were: Polyvalent botulinus antitoxin, 30 c.c. intravenously; gastric lavage; calomel, ¼ grain (0.015 Gm.) every 15 minutes for 8 doses, followed in 2 hours by magnesium sulphate, 1 ounce (30 Gm.); high colonic irrigations every 4 hours; milk, 8 ounces (250 c.c.), and

water, 16 ounces (500 c.c.), every 4 hours, and strychnine,  ${}^{1}\!_{60}$  grain (0.001 Gm.) every 3 hours hypodermically. After 4 days of treatment the patients could swallow a little fluid and the eye disturbances began to recede. Recovery followed.

In cases with strangling and nasal regurgitation due to paralysis of the mechanism of deglutition, Naugle (loc. cit.) has the patient, seated in bed, draw up fluids into the mouth through a tube. Before swallowing, the patient takes a full breath, then allows the fluid to run down his throat while he breathes out, the issuing air keeping the fluid from passing into the lower respiratory canal.

BRAIN.—ABSCESS.—That a cerebral abscess may, like other pus collections, point externally was shown in a case reported by H. Drummond (Brit. Med. Jour., June 7, 1924). The condition, in a man aged 23, followed a discharge from the left ear, preceded by earache. Increasing tenderness finally developed over the zygomatic process of the left temporal bone. Incision brought forth 2 teaspoonfuls of pus. Death occurred during an attempt to trephine over the left temporosphenoidal lobe, which was found to contain an abscess communicating with the temporal fossa through a small hole in the great wing of the sphenoid. In a case recorded by J. P. Parkinson and L. R. Broster (Lancet, June 2, 1923), the brain abscess in a child of 4 years was secondary to lung disease, and eroded through the skull to form a tumor beneath the scalp, suggesting at first a subperiosteal gumma.

Alveolar periostitis of the left upper jaw was the source of the infection in a case reported by L. Sussig (Med. Klin., Nov. 23, 1924). From observations at the autopsy the infection is believed to have passed through the temporal bone.

Among abscesses secondary to otitis media, mastoid and accessory nasal sinus inflammation, C. Bagley, Jr. (Jour. Amer. Med. Assoc., Dec. 29, 1923) found the shortest interval between the initial symptom and the drainage of the abscess to be 3 weeks. Fear of abscess frequently prevents the physician from facing the unpleasant situation until the appearance of grave symptoms. In differentiating abscess from neoplasm, encephalitis and meningitis, the history of a primary inflammation in the adjacent cavities or of pulmonary suppuration is valuable; vet the writer has been misled in tumor cases associated with such suppuration. The rapidity of progress of symptoms in abscess is helpful, but not entirely trustworthy, as some tumors progress rapidly. In 1 case of encephalitis the diagnosis was made possible by a negative needle exploration of the parietal lobe. Absence of choked disk, high temperature range and pulse rate would make the diagnosis possible without aspiration. In the difficult but important differentiation between abscess and meningitis, lumbar or ventricular puncture, being very dangerous in abscess, is warranted only when the balance of evidence is in favor of meningitis, for the purpose of confirmation. High intracranial pressure in these inflammaconditions renders lumbar puncture dangerous just as it would

be in brain tumor. In cases hemianopia proved the only sign of localizing value. Ophthalmoscopy for choked disk proved helpful in all cases of long duration.

According to G. Hadfield (Lancet, Oct. 27, 1923), a differential count of the cells in the cerebrospinal fluid while this fluid is still clear is of diagnostic service. In 2 cases there were 12 cells per cu. mm., polymorphonuclears being responsible for the increase. At autopsy brain abscesses which had not discharged into the ventricular system were found.

TREATMENT.—There is still a wide divergence of opinion as to the proper procedure in evacuating brain abscesses. According to Bagley (loc. cit.), breaking of the abscess wall in the operation must be avoided. Decompression is a bad procedure, favoring rupture of the membrane, with escape of pus into the ventricle, subarachnoid space or brain tissue. In the usual type of deep abscess, simple drainage through a small opening as near the bottom as possible gives the best results. The opening in the skull and dura should be only large enough to accommodate the drains, thereby preventing herniation. At the initial operation a goodly portion of pus can be evacuated, and folded rubber drains or split rubber tubes should be placed well into the depths of the cavity, to remain until there is practically no pus and one feels that there persists only a small sinus just around the drains. If these have been satisfactorily placed, free drainage will begin by the 5th day. Thereafter only the outside dressings should be changed. As the wall contracts the drains may be extruded a few millimeters a week after the

first 3 or 4 weeks. To provide for this and prevent injury to the abscess wall within, the drains should be cut close to the scalp and dressings applied about them so as to prevent pressure on their outer ends. Gravity as an aid to drainage should always be considered in the placing of drains. Drainage for 3 or 4 months may be required, but the course is otherwise simple and there is little risk of having the infection light up after an apparent cure. Of 21 cases thus treated, 12 recovered. Sharpe (N. Y. State Jour. of Med., Feb. 8, 1924) places the mortality of brain abscess with operative drainage at over 50 per cent., and without operation, at 100 per cent.

C. E. Dowman (Arch. of Surg., May, 1923) likewise disapproves of large openings into the skull and dura and immediate free drainage on the ground that they favor meningitis and brain fungus. Immediate drainage might be safe if preformed adhesions between the dura and cortex were present, but this is rare, except in abscess following injury caused by some foreign body. Induction of protective adhesions, if such are not present, should be procured before free drainage is estab-The abscess is first located with the exploring needle and drained through a small trephine opening.

On the other hand, J. E. J. King (Surg., Gyn. and Obst., Nov., 1924) reports 3 consecutive recoveries after a very different scheme of treatment, featured by a complete unroofing of the abscess cavity by an incision in the cortex around its entire margin, through a sufficiently large opening in the skull. The cavity is then thoroughly irrigated with Dakin's

solution and gently sponged or wiped out. This is followed by a spontaneous herniation or eversion of the cavity. No drainage materials are used, but fenestrated rubber dam is employed to protect the surface of the hernia, and the entire area is kept thoroughly wet with Dakin's solution. This is followed, in the course of some weeks, by recession of the hernia. Overdistention of the ventricular system is prevented by means of lumbar puncture, if indicated. The wound is strapped with adhesive strips after the slight necrosis on the surface of the hernia has become covered with healthy granulations, followed by epithelialization and recession of the hernia. The average time required for these results is  $2\frac{1}{2}$  to 3 months. After 1 year or more, following complete healing of the wound, a scalp plastic with approximation of hair-bearing scalp edges may be advisable, and after 11/2 to 2 years the cranial defect can be repaired by cranioplasty.

According to R. Bárány (Acta otolaryng., vi, 74, 1924) there may arise through internal pressure in cases of brain abscess or infected wound a form of vicious circle which calls for treatment by prompt withdrawal of cerebrospinal fluid, either by lumbar puncture, in cerebral abscess, or by ventricular or callosal puncture, in abscess of the cerebellum.

FAT EMBOLISM.—Melchior (Mitt. a. d. Grenzg. d. Med. u. Chir., xxxviii, 178, 1924) calls attention to certain signs of value in the differentiation of this condition from traumatic intracranial hemorrhage. Absence of slow pulse and of abnormal pupillary conditions speaks for the former condition. Again, there is no choked disk, and gener-

ally no headache nor vomiting. There are commonly fat droplets in the urine and numerous punctate skin hemorrhages in fat embolism.

**HEMORRHAGE.**—See CEREBRAL HEMORRHAGE.

INJURIES.—Greater conservatism has been manifested of late in decompression for traumatic brain injuries. Indeed, according to H. E. Randall (Jour. Mich. State Med. Assoc., Jan., 1924), less than 10 to 20 per cent, of all cases call for operation. He warns, in particular, against operation in the presence of shock, manifested in hypotension, rapid pulse, pallor and clammy skin. All depressed fractures of the vault should, however, be operated after shock has passed. Severe injuries cause a slow pulse and later a high and rising blood-pressure. Mydriasis and the pupillary light reactions are neither of diagnostic nor prognostic value, and unconsciousness is not of itself unfavorable. The term "concussion" should be discarded. Brain contusion and laceration with shock symptoms cause a rapidly rising temperature, respiration and pulse, and nothing in a surgical way can be accomplished. Medullary compression and edema following brain injury show an increasing pulse rate, temperature and respiration to the moment of death. H. P. Brown, Jr., and E. A. Strecker (Ann. of Surg., Feb., 1924), reporting on 100 cases of skull fracture, note that of the cases operated upon 11 recovered and 6 died, giving an operative mortality of 35.2 per cent., while of those not operated, 63 lived and 20 died, giving a mortality of 24.4 per cent. While the former group were in a more serious condition, the general impression is in favor of conservative treatment by rest in bed, purgation and a light diet, unless progressive, threatening evidences of pressure develop necessitating exploratory decompression.

Increased use is being made of lumbar puncture for both diagnostic and therapeutic purposes, as well as, by some, as an indication for operative decompression. N. A. Fogg (Jour. Maine Med. Assoc., Mar., 1924), in the stage of shock, orders absolute quiet, external heat, stimulating enemas, and narcotics for restlessness. In cerebral concussion, an ice-bag is applied to the head, the pulse observed every 1/2 hour, and lumbar puncture done to detect increase of pressure or blood in the spinal fluid. Compression is watched for very carefully, and if the spinal pressure rises above 16 mm. Hg operation is indicated, though not if medullary edema exists. Lesions without fracture are often more serious than those with fracture. In compound injuries badly contused bone and tissue should be excised.

When a patient is unconscious for several hours, H. S. Stacy (Med. Jour. of Australia, Jan. 3, 1925), in accord with many others, deems lumbar puncture under local anesthesia the best treatment, though in depressed fracture immediate operation is generally advisable, as also in suspected middle meningeal hemorrhage. The puncture, at the 4th lumbar space, is repeated every 6 hours, with the intervals lengthened gradually to 24 hours when the case is less severe. The amount withdrawn ranges from 20 to 30 or even 40 c.c. Under this treatment consciousness gradually returns; 3 or 4

punctures usually suffice. According to T. M. Green (Intern. Clin., June, 1924), in a case with evidences of intracranial hypertension the removal of enough spinal fluid to lower the pressure to 10 mm., repeated every 12 hours, may tide the patient through without operation. If, however, the pressure goes on increasing, subtemporal decompression is indicated, on the right side in right-handed subjects and on the left in the left-handed. Elevation of a depressed fracture should never precede the decompression if the pressure attains 16 mm.

J. G. Lyerly (Va. Med. Mthly., Feb., 1924) advocates a definite division of the cases into those with intracranial hypertension and those without. In the former, the cause of the increased tension may be either brain edema, hemorrhage, or both; meningeal hemorrhage; infections such as meningitis, encephalitis or abscess, or localized pressure, in depressed fractures. criteria of dangerously increased pressure are coma, the pulse rate, the systolic and diastolic pressures, the eye-ground findings, and the spinal fluid pressure. Rapid increase of pressure, as from hemorrhage, calls for prompt procedures such as subtemporal exposure for evacuation of the clot and to arrest bleeding. In more slowly rising pressure, as in cerebral edema, hypertonic sodium chloride or magnesium sulphate solutions may be given by mouth and daily lumbar punctures carried out.

Pressure anemia of the brain cortex continuing over 12 hours causes permanent destruction of its cells, according to H. Jackson (III. Med. Jour., Feb., 1924), who advises dia-

gnostic lumbar puncture as soon as shock has passed off—in 2 to 6 hours after the injury as a rule. should not wait for slow pulse, stertorous breathing, rise of bloodpressure and temperature, and papilledema, as these only appear many hours after the onset of pressure on the cerebrum, and indicate pressure on the medulla. If the spinal fluid pressure, ascertained within 6 hours, exceeds 7 to 9 mm. Hg and blood is present in the fluid, the writer at once institutes treatment by lumbar drainage. Medullary pressure appears if the cerebral pressure is kept low for 3 to 5 days. No case of death from herniation of the medulla into the foramen magnum occurred in his 5000 lumbar punctures.

Neurologic and X-ray examinations are also made by J. S. Rodman and B. B. Neubauer (Ann. of Surg., Apr., 1924) in these cases. Where the spinal pressure is 8 to 10 mm. and the blood-pressure likewise normal or slightly raised, they advise rest in bed for 4 or 5 days, an icecap, magnesium sulphate by the bowel, and sedatives as required. In cases with the spinal pressure 10 to 18 mm., a moderate rise in bloodpressure, temperature and pulse rate, and a normal respiratory rate, the rest and ice-cap are supplemented by elevation of the head of the bed, repeated lumbar punctures, intravenous injection of 60 to 80 c.c. (2 to 2\% ounces) of 15 per cent. hypertonic salt solution, or magnesium sulphate by rectum. In a 3d group of cases, with spinal pressure exceeding 18 mm., rising and later falling blood-pressure, slowing pulse, congestion of the retinal vessels and coma, subtemporal decompression, sometimes bilateral, is indicated in addition.

Attention is directed by J. F. Corbett (Jour.-Lancet, Feb. 1, 1924) to tortuosity of the veins and congestion of the optic disk as the 1st retinal sign of intracranial pressure increase, which may, however, already have existed before this sign appears. Of 25 cases of severe head injuries with evidence of severe brain laceration and blood-stained spinal fluid, none showed choked disk, though blurring of the nasal 1/2 of the disk was present. Repeated lumbar punctures were done to reduce pressure in these cases of apparent edema of the brain. Brain edema alone does not call for early puncture, but in cases with increasing mental torpor or coma, it is indicated in the period from 8 to 72 hours after the injury. Respiratory embarrassment or marked slowing of the pulse also calls for it, though if carried out late it may slow the pulse further. Of the 25 cases, 16 recovered and 9 died of hemorrhage, shock or meningitis.

> Attention is called by H. C. Naffziger (Jour. Amer. Med. Assoc., May 31, 1924) to subdural fluid accumulations, apparently of cerebrospinal fluid, frequently found in decompression operations. This fluid, probably having escaped into the subdural space through a tear in the arachnoid membrane, cannot be drained away by lumbar puncture because it is no longer in the subarachnoid space, and spurts out under great pressure at operation. Its removal by the decompression operation leads to rapid improvement where symptoms of high intracranial pressure have pre-existed.

> A safety-valve procedure for the prevention of death from intracranial hemorrhage due to trauma has been described by J. E. Jennings (L. I.

Med. Jour., Mar., 1924). Lumbar puncture, revealing subarachnoid blood, points to subdural hemorrhage. The source of the bleeding is nearly always supratentorial, but the lethal damage is done by percolation of the blood into the lower chamber and its penetration about the brain stem. To prevent this migration of the blood, the writer incises vertically 3 fingerbreadths in front of the ear, enters the temporal bone with a drill or small trephine just behind the temporosphenoidal suture, and enlarges the opening in all directions except upward to expose an area 11/2 by 3/4 inch, with its lower edge at the floor of the middle fossa. In the absence of extradural hemorrhage, he opens the dura low down so as to form a valvular flap, inserts a small drain under the brain, and closes the muscles, fascia, and skin as usual. On the operating table, as well as later on the bed, the patient is kept face down, with the head lowered 30°, for 12 to 24 hours, after which the bed is leveled and the drain removed. Of 9 cases of fracture of the base with evidence of intracranial hemorrhage, thus dealt with, all but 1 case recovered.

Minor brain injuries, such as result from a fall on the head, with slight concussion and momentary unconsciousness, or localized violence of the skull without these symptoms, are discussed by W. Trotter (Lancet, May 10, 1924). Such injuries are prone to be followed by intractable headache occurring in attacks of a few hours' to 3 days' duration, of a severe, throbbing, bursting character, and frequently brought on by unusual exertion, excitement or anxiety. The long persistence of the headache is ascribed to the fact that the brain can undergo compensatory swelling only to a limited extent and, circulation through its bruised area being embarrassed by the extravasated material, resolution is indefinitely delayed. With the headache may occur giddiness, memory defects, deficient concentration and attention, changes of disposition, and certain forms of mental deterioration. The prophylaxis of this condition consists in rest in bed and very slow resumption of active life. If this fails, a right subtemporal decompression is almost sure to bring relief. Operation right at the start may be called for in localized brain contusion, and involves the making of an opening in the skull and dura over the area.

In a case reported by G. T. Vaughan (Va. Med. Mthly., Dec., 1923), severe laceration had resulted from a blow in the left occipital region. There were symptoms of pressure, vomiting, dizziness and headache, though consciousness was not lost. The patient had apparently recovered until, 5 weeks after the injury, he developed increasing headache, weakness, and finally unconsciousness. Exposure of the right frontal region revealed a large subarachnoid clot.

Either ingravescent hemorrhage or traumatic cyst should be suspected, according to C. E. Dowman (Jour. Med. Assoc. of Ga., Dec., 1923), where symptoms continue or recur in a more severe form after cranial injury. He reports 5 cases of traumatic cyst or fluid collections in or about the track of a foreign body. The fluid was hemorrhagic in 2 cases and consisted of cerebrospinal fluid in 2 others, while in the 5th there was a spicule of indriven bone surrounded by purulent material. Uniform recovery followed drainage of the cyst, with removal of as much as possible of its wall. Such cysts might be prevented by immediate, careful débridement of the compound fracture with excision of the tract and removal of the foreign material.

In a study of brain injuries at birth, W. Sharpe (Northwest Med., July, 1924) carried out lumbar puncture within 12 to 48 hours after birth in a series of 364 newborn infants, and found free blood in the cerebrospinal fluid in 39 instances. In only 20 of the latter were there signs of a possible hemorrhage. The writer advocates early lumbar puncture for both diagnostic and therapeutic purposes and for the prevention of later spastic paralysis with mental retardation.

Among the remote effects of brain injuries of military or industrial origin, F. Brodie (Ibid., May, 1924) found the symptomatic triad of tremors, fatigue and phobias highly characteristic. The physical symptoms in cases of incomplete recovery comprised paralysis in 24 per cent.; sensory change, 22 per cent.; increased reflexes, 16 per cent.; fits, 13 per cent., and optic neuritis, 10 per cent. Mental symptoms comprised memory impairment, 22 per cent.; inability to concentrate, 18 per cent., and emotional disturbances, 10 per cent. Under psychic symptoms, present in 18.5 per cent., are classed insomnia, tremors, asynergia, stammering, incoördination and phobias, especially a fear of high places. Apparent absence of focal symptoms does not justify a diagnosis of neurosis. The treatment, if local causes of irritation are present, consists, e.g., in the elevation of depressed fractures, smoothing of rough bone edges, removal of unabsorbed clots or cysts, and freeing of adherent scars, followed by bone-grafting. usually, however, the cause of the symptoms is general intracranial hypertension, relief of which is to be effected by rest in bed; magnesium sulphate, enough each morning for

a week to produce 6 to 8 watery evacuations in the day; repeated lumbar puncture, particularly adapted to cases not exceeding 2 to 3 months' duration, and, in cases of longer standing, subtemporal decompression.

Reëxamining after the lapse of 1 to 7 years 340 soldiers who had been trephined at the time of injury, L. Weitzel (Rev. de chir., lxi, 551, 1923) found in the majority of instances psychic changes, weakness and impairment of memory. From 10 to 20 per cent. of their normal wage should be allowed in compensation. Epileptic manifestations occurred in 19 per cent., but often gradually receded. The size of the trephine opening had no bearing on the after-effects. Minute fragments of projectiles in the brain do not preclude long survival, and it is better to allow them to stay than to injure the brain seriously by their removal.

In 2 cases of traumatic meningoencephalitis J. E. Olmos (Semana med., Aug. 7, 1924) obtain very good results from prompt treatment with vaccines, serum and a silver salt.

INTRACRANIAL TENSION.— Increasing attention is being paid to exact determination of the tension of the cerebrospinal fluid in traumatic and other brain conditions. Waiting for choked disks to appear has been recognized as inimical to the interests of the patient, this condition in reality signifying that a greatly increased intracranial pressure has already existed for a prolonged period. According to A. S. Maclaire (N. Y. Med. Jour., Sept. 19, 1923), one can no longer hope to perform brain operations intelligently without the use of the spinal mercurial manometer. To estimate increased intracranial pressure roughly by the flow from the needle on spinal puncture is quite inadequate. In 2 cases (cerebellopontine angle tumor and endothelioma) operation was delayed for weeks because the fundi failed to reveal the desired information, whereas the spinal manometer would have promptly decided the issue had it been used. It detects early rises in pressure, which can be closely watched by repeated readings, e.g., daily in traumatic cases and once or twice a week in brain. tumors. There is no fear of medullary. injury in puncturing the subarachnoid space, for no fluid need be removed in the test. The procedure also obviates the secondary optic changes occurring in choked disks. Its wider adoption will prevent many needless deaths.

> Increased intracranial pressure acts first on the respiratory center, according to Tsubura (Brit. Jour. of Exp. Path., Oct., 1924), causing transitory hyperpnea and then sudden respiratory arrest. The cardioinhibitory and vasoconstrictor centers are next affected, with increased tonus and reflex excitability. The vasoconstriction affects the entire body. There are also indications of alterations in the cardio-accelerator and vasodilator centers. High pressures lead to paralysis of the cardioinhibitory and finally of the vasoconstrictor centers. The effects are due partly to anemia and partly to the accumulation of waste products attending the diminution of blood-flow.

X-ray evidences of increased intracranial pressure were noted by L. J. Friedman (N. Y. Med. Jour., Oct. 3, 1923) in a large percentage of 750 cases examined for brain injury or pathology. The acute cases show a peculiar mottling of the skull field, with areas of increased illumination and intervening spaces of normal brain shadow. This appearance justifies the diagnosis of a diffuse, mild form of edema of the brain. This may arise not only from injury, but also from the laceration of the brain which occurs, according to Von Bergmann, in concussion. In the absence of skull fracture, mottling indicates concussion. Mottling is usually absent in cases of extensive fracture, especially if compound, presumably on account of the relief of tension and escape of fluid in such cases. Rupture of a vascular twig in the epidural space produces the shadow of a small hematoma, accompanied by the usual pressure symptoms. The subacute type of intracranial pressure, occurring longer after the accident, with symptoms such as headaches and vertigo, also leads to a mottling, though less extensive than in the acute form,

The chronic type occurs in 2 forms, the congenital, seen sometimes in normal subjects and those of subnormal mentality, and the acquired, observed in injury, epilepsy and occasionally in brain tumor. X-ray evidences of chronic increased pressure are crescentic osteoporotic areas of the inner table, general or confined to the frontal, parietal or occipital areas, and accentuation of the grooves for the intracranial vessels. At times, there coexist clinical signs such as anisocoria, incoördination, headaches, optic disk changes, convulsions, vertigo, nystagmus, vomiting, diplopia, psychic disturbances, etc. Injury to the head in a child may, as illustrated in personal cases, lead to exaggerated convolutional impressions with uncontrollable irritability and homicidal and

suicidal tendencies. Convolutional impressions in unruly or mentally inferior children are prognostically unfavorable.

The further experiences recently recorded concerning various hypertonic saline solutions in the treatment of intracranial hypertension are of interest. H. Cohen (Brit. Med. Jour., Mar. 8, 1924) showed in cats that hypertonic saline solution markedly reduces the pressure, whether administered intravenously, by mouth or by rectum. In 6 cases of inoperable brain tumor given 20 c.c. of 30 per cent. sodium chloride solution intravenously, relief for 10 hours to 2 days was afforded; repetition every 3d day usually kept the patients free of headache. The pressures were reduced in 20 minutes from 780, 940 and 840 mm. of water to 90, 100 and 70 mm. Sodium chloride by mouth in the dosage of 3 to 6 5-grain (0.3 Gm.) keratin-coated tablets 3 times a day gave much less pronounced relief. In a case of large cerebral hernia following operation for cerebellopontine angle tumor, intravenous injection of hypertonic salt solution reduced the hernia, improved the gait, and relieved the headache.

In experiments in dogs, T. Fay (Jour. Amer. Med. Assoc., Mar. 8, 1924) found that 3 per cent. sodium chloride solution and 25 per cent. magnesium sulphate, introduced in equal quantities in tied-off loops of small intestine, began to lower the cerebrospinal pressure within 3 minutes, and that the magnesium sulphate solution was almost twice as efficient in the process of dehydration (withdrawing fluid into the bowel loop) as the sodium chloride solution isotonic to it. Meanwhile a

gradual rise of blood-pressure took place. In the treatment of acute traumatic cases by this method, careful note must be taken as to whether profound shock coexists. In concussion and intracranial hypertension, magnesium sulphate for dehydration and relief of brain congestion is valuable, but in shock dehydration is contraindicated. The indications for the measure are based mainly on the respiratory and temperature curves. Increased tension leads to a gradual fall in the respiratory rate and to rising temperature readings; the fall in respiration may be gradual to zero, or Cheyne-Stokes breathing may supervene. In shock the respirations are above normal and temperature recedes.

According to O. Marburg (Wien. klin. Woch., Oct. 2, 1924), X-ray exposure of the brain, in particular the choroid plexuses, is of value in cases with symptoms of intracranial hypertension.

Cerebrospinal hypotension has likewise been taken into account of late. C. Bagley (Arch. of Surg., Jan., 1923) reports 3 cases of cerebral trauma which showed a definite decrease in intracranial pressure. the 2 cases which came to necropsy the morbid anatomy was limited to the structures about the veins of Galen, from which multiple fine hemorrhages had evidently occur-The clinical picture in all 3 cases was similar to that seen in fatal cases of intracranial hypertension, with rapid pulse, greatly increased respiration rate and extreme hyperpyrexia. Other manifestations were reduced muscular power, spasticity, increase of the deep reflexes, and unconsciousness. The writer considers this syndrome as a special one due to lesions in the region of the veins of Galen.

Cases illustrating the incidence and effective treatment of intracranial hypotension are reported by J. Hertz and R. Soupault (Bull. Soc. nat. de chir. de Paris, Feb. 9, 1924). One patient was a young girl with Jacksonian epilepsy following a fall on Lumbar puncture rethe head. vealed a spinal tension of but 9 to 10 cm. and brought on severe headache, which was relieved by 4 intravenous injections of 40 c.c.  $(1\frac{1}{3})$ ounces) of distilled water. This procedure is regarded as producing a hypotonic condition of the blood, as a result of which fluid passes from it to the tissues, whereupon the ventricles of the brain become refilled. In 3 cases of spinal anesthesia with low spinal tension, violent headache and nausea, rapid relief followed subcutaneous injections of 3 to 5 liters (quarts) of normal saline solution in 2 cases and 2 intravenous injections of 10 c.c. (21/2 drams) of distilled water in the 3d. In a case of cranial trauma in an old woman, with semi-coma several days later, the spinal tension proved to be low and the fluid contained blood. Gradual recovery with increase of the spinal tension followed subcutaneous injections of 250 c.c. (1/2 pint) of normal saline solution and enemas of water.

SYPHILIS.—Visual failure of obscure causation calls for a Wassermann test of both the blood and spinal fluid, according to C. B. Welton (Ill. Med. Jour., Apr., 1924), who reports a case in which visual disturbances, present for 5 months, had been an early and rather isolated

manifestation of cerebral syphilis. The patient, a young girl, had been having attacks of migraine for some years, then, with the failure of vision, developed photophobia, lacrymation and deafness. There was concentric contraction of the visual fields and enlargement of the blind spots. Yet the fundi were negative upon ophthalmoscopy. Both the vision and hearing were markedly improved by antisyphilitic treatment.

TUMORS.—SYMPTOMS.—In 30 cases of brain tumor discussed by G. Bickel and E. Frommel (Schweiz. med. Woch., Dec. 20, 1923), the greatest incidence was in the 6th decade of life, which comprised 30 per cent. of the cases. This contrasts with the prevailing view that such tumors are most frequent between the ages of 20 and 40. Trauma preceded the tumor in 12 per cent. Constant headache was present in 65 per cent.; its location failed to give any indication of the site of the tumor. Choked disk existed in 56 per cent.; only in 10 per cent. did its greater degree on 1 side afford information as to the side of the tumor. Mental disturbances were pronounced in 15 cases, but usually of terminal advent, consisting of mental failure, altered disposition, melancholia, confusion, loss of orientation and even a true dementia. Exophthalmos occurred in but 1 cerebellar tumor and hiccup in 2 occipital lobe tumors. Slow pulse was noted in only 2 cases of very large tumor. The spinal fluid pressure was found increased in 70 per cent. In 1/4 of the cases the course of the disease comprised a series of exacerbations with intervening remissions.

The same writers (Rev. méd. de la

Suisse rom., Jan., 1924) discuss a type of brain tumor case running a course of progressive thrombotic softening and featured clinically by a succession of mild apoplectic attacks, frequently preceded by headache, vertigo, somnolence or impairment of memory. The attacks usually do not produce unconsciousness or a fall, but are followed by weakness and flaccid paralysis of the extremities, most of which passes off in about a week. Progressive mental deterioration occurs, and at the end, sphincter paralysis and general collapse occur. Six such cases, all in persons over 60 years of age, were seen among 40 brain tumors. The spinal fluid pressure and pulse rate being often normal, the presence of a tumor in these cases may not be suspected. The only significant sign of tumor found was a high albumin content of cerebrospinal fluid coupled with a normal cell count; in encephalomalacia high albumin without increase of cells is rare. In all of these instances the tumor was in the deeper and more silent regions of the brain, vis., in the region of the centrum ovale or the frontal region.

Sudden onset of symptoms in brain tumor has been witnessed in a number of cases by G. Wilson and N. W. Winkelman (Atlantic Med. Jour., Feb., 1925). In some instances the abrupt illness proves to have been due to a hemorrhage into the tumor or neighboring tissues. Aside from hemorrhage, the rise of intracranial pressure initiating the disturbance may be due to ingestion of alcohol or traumatism. Once the precarious intracranial balance in latent brain tumor has been broken, the course of the disease becomes

stormy, and a fatal ending is not far distant. While the symptoms in such cases resemble those of a vascular lesion, it should be borne in mind for diagnostic purposes that such a lesion in the brain is rare before the age of 40 in persons with an intact cardiovascular system. Operative treatment is but palliative in these cases, the tumor usually being a glioma.

Of 7 cases of brain tumor in children studied by M. Wollstein and F. H. Bartlett (Amer. Jour. Dis. of Childr., Apr., 1923), 5 were in the cerebellum, 1 in the left cerebral hemisphere and 1 in the basal ganglia. The medulla and pons were involved in 2, and the upper cervical cord compressed in 3. Hydrocephalus was present in all. The physical signs were very variable, convulsions absent, vomiting inconspicuous and the spinal fluids not significant.

C. H. Frazier (Ill. Med. Jour., Aug., 1924) warns against a tendency to procrastination in dealing with these cases even when the evidence of tumor admits of no doubt. Given a succession of definitely focal convulsions, without evidence of trauma, attended at first with transitory weakness of a limb, a presumptive diagnosis of tumor is absolutely justifiable. The cases with initial focal symptoms and later signs of increased intracranial tension are generally those of cortical tumors, whereas the cases with initial signs of increased tension are usually those of deep-seated growths. Failure of vision, headache and convulsions are the 3 most common initial signs of tumor. In high-grade choked disk with advancing optic atrophy, one should not be unduly influenced by the serologic tests, but should continue to suspect tumor until the evidence is definite either way. For tumor localization the ventriculogram is helpful as a last resort when there is no reasonable clue, but the special electrode is even more important. Out of 25 recent cases the localization was confirmed on the operating table in 20.

According to C. A. Elsberg (Arch. of Ophth., July, 1924), papilledema should be looked upon as a very late symptom of brain tumor. Even when of slight degree and without loss of vision, it demands relief as soon as possible. The case should come to the surgeon when fundal changes are still slight or not yet even observable. Thus, in tumors of the cerebellopontile angle, the symptoms are usually so characteristic that operation should precede any change of the disks from obstruction of the aqueduct of Sylvius or pressure on the pons. In lateral recess tumors, the papilledema may be quite sudden and progress rapidly, often with a greater edema on the side of the In general, tumors most tumor. distant from the midline are the most likely to cause a papilledema equal on the 2 sides, while in tumors near the midline the edema is more advanced in 1 or the other eye. However, mesial growths from the falx, pineal, or interpeduncular space usually cause changes equally marked on the 2 sides. Papilledema is likely to be late in anterior frontal tumors and in dural growths over the motor area. It is sometimes completely absent because of pressure of the growth on a large brain artery, causing extensive softening. Frontal lobe tumors may produce optic atrophy on the side of the growth and signs of papilledema on the opposite side.

W. B. Terhune and A. F. Riggs (Boston Med. and Surg. Jour., June 26, 1924) warn that the appearance of the fundi may change rapidly. Any suspicious fundus should be followed carefully at intervals no longer than a week, with concurrent neurologic examinations. In 1 of their cases there had been noticed merely a slight difference in the color of the optic disks; 2 months later, papilledema on both sides suddenly appeared. They also call attention to the frequency of nervousness in brain tumor and the importance of drowsiness as a sign of organic nervous disease.

The cerebellar symptoms that may be produced by suprasellar tumors are discussed by P. Bailey (Arch. of Neurol. and Psych., Feb., 1924). Among them are disturbances of equilibration. A careful clinical history is of differential importance, since in the suprasellar growths the cerebellar symptoms are late in advent, while in cerebellar tumors they occur early. Again, the former lack the tremor and hypotonicity of cerebellar tumor, while they may be attended with bitemporal hemianopsia, primary optic atrophy, genital atrophy and dyspituitary symptoms.

> In a case of tumor of the frontal lobe, in addition to typical evidences such as headache and loss of spontaneity, Sarbó (Klin. Woch., Jan. 22, 1925) observed a tendency on the part of the patient to fall backward, and later ataxia, which he ascribed to extension of the tumor to the nucleus ruber. This was confirmed at the autopsy.

DIAGNOSIS.—The specificity of the Wassermann reaction in cases of brain tumor has of late been called into question anew by M. P. Weil

and R. Weismann-Netter (Bull. Soc. méd. des hôp. de Paris, Nov. 8, 1923), who report the case of a woman treated surgically for mammary cancer, with a later pulmonary metastasis, a positive spinal fluid Wassermann, and an epitheliomatous tumor of the meninges found in addition at the autopsy. A negative history for syphilis and a negative blood Wassermann were combined both in this case and in another of psammoma of the cervical cord, in which the spinal fluid not only yielded a positive Wassermann test but showed excess of albumin and lymphocytes. Thus, a positive spinal Wassermann cannot be said definitely to prove that syphilitic central nervous disease exists. C. Vincent (Ibid., Nov. 29, 1923) reaches a like conclusion from careful study, including postmortem examinations, of 4 cases. In a case of encephalocele following decompression for a glioma, the fluid in the encephalocele gave a positive Wassermann while the blood and spinal tests were negative. Other cases indicated that the cutting off of fluid in a section of the subarachnoid space for a considerable time by a tumor may lead to a positive Wassermann in the cut-off body of fluid. In view of these facts, the antisyphilitic therapeutic test, when employed in suspected brain tumor, should, if negative, not be kept up too long; at all events, not until blindness has supervened.

H. Cushing (Arch. of Neurol. and Psych., Dec., 1923) finds it advisable, in suspected brain tumor, to incline toward this diagnosis until it can be disproved. Choked disk should be regarded as suspicious of tumor, even with negative neurolo-

gic findings. Choked disk coupled with an encephalitic syndrome is very suspicious. The symptoms of cerebral aneurism may closely simulate brain tumor; rupture of the aneurism often suggests a stroke of apoplexy, with recovery not uncommonly following. Ventriculography may serve to localize an increasing number of tumors, but is oftentimes unnecessary, upsetting to the patient, and in the majority of instances does not replace a thorough neurologic examination. Adenomas, mostly of pituitary origin, often cause headache at first, but not uncommonly this disappears before extrasellar pressure disturbances begin. Among such cases operated by the transphenoidal route the mortality was 9.9 per cent., and among the much smaller number of cases that were dealt with transfrontally it was 5.2 per cent.

> In a case of brain sarcoma in a man aged 57, seen by Sakorrafos (Ann. de méd., Aug., 1923), a diagnosis of epidemic encephalitis had been made because of the somnolence, diplopia, ptosis, and occasional fever suggestive of the latter disease. The cerebrospinal fluid findings had appeared to support such a diagnosis. The only discordant symptom was the slow pulse rate of 60. Autopsy showed a sarcoma in the midbrain. Similar confusion occurred in a case of sarcoma of the base in a woman of 22, reported by Obregia and Paulian (Encéphale, Nov., 1924), the patient exhibiting somnolence, loss of the accommodation reflex, nystagmus, katatonia, tremor, the Parkinsonian attitude, adiadochokinesis, rigidity, and high sugar content of the spinal fluid. The chief symptoms suggesting brain tumor were vomiting, staggering and a tendency to fall to the left. The autopsy showed a gliosarcoma involving the optic thalami.

Of the focal symptoms of tumor of the temporal lobe, aphasia is of importance. Amnesic aphasia, or inability to use the right word, as exemplified in a patient complaining of a pain in the hand when he really refers to pain in his foot, is emphasized by W. G. Spiller (Atlantic Med. Jour., Aug., 1923) as 1 of the earliest indications of involvement of the temporal lobe. According to I. S. Wechsler (Jour. of Nerv. and Ment. Dis., Jan., 1924), however, aphasic symptoms are sometimes misleading in tumor localization. He reports 4 cases supporting his view that the prevailing classification of aphasia into pure sensory and motor, cortical, subcortical and transcortical is in need of revision.

General paralysis was simulated by an endothelioma of the right fronto-parietal region in a case seen by C. Rosenheck (Jour. Amer. Med. Assoc., Feb. 17, 1923). Abnormal irritability, generosity, euphoria, memory defects, etc., were noted, with mismanagement of the patient's business and fantastic financial transactions. The diagnosis was ultimately made on the basis of serologic tests, altered reflexes, 7th nerve paresis, and choked disks. Operation was followed by recovery.

According to G. Horrax (Arch. of Neurol. and Psych., Nov., 1923), hallucinatory flashes of light, color or zigzag lines point to an *occipital* lesion, whereas hallucinatory images with clear-cut pictures occur in *temporal* lesions.

V. Christiansen (Rev. neurol., Aug., 1924) reports 6 cases of tumor of the region of the *optic chiasm*, featured by a varying degree of increase of the cells in the cerebrospinal fluid, in 1 case as high as 20,000 per cu. mm.

This increase did not seem to be due to a meningeal reaction. Syphilitic lesions of the chiasmal region produce the same ocular symptoms as these tumors, but can be differentiated by the history and the fact that in syphilis the involvement is seldom confined to so restricted an area, evidences of nervous lesions elsewhere usually coexisting.

Bárány Test.—This test is, as is well known, practically conclusive in the diagnosis of tumors of the cerebellopontile angle, as well as of some value in all tumors in the posterior According to D. E. S. fossa. Wishart (Jour. of Laryng. and Otol., Mar., 1923), it may be usefully applied also in other ways. Tumors of the frontal lobe fail to modify the vestibular or cochlear functions. Out of 11 cases of definitely established brain tumor comprised in a series of 100 cases of deafness, vertigo, vomiting or staggering, there were several in which, other evidence being inadequate, localization was assisted by use of the Bárány test.

X-ray Examination.—Such conditions as calcified tumors or cysts, endostoses, convolutional markings and sellar changes may be detected by simple röntgenography. As noted by R. R. Newell (Surg. Clin. of No. Amer., June, 1923), gliomata are not infrequently calcified, and the utility of the X-ray for diagnostic and localizing purposes in brain tumor should not be underestimated. According to D. D. Talley, Jr. (Va. Med. Mthly., Feb., 1923), the entire growth or part of it may be actually visible as a shadow, and the local pressure atrophy or erosion of the cranial walls or floor may likewise be significant.

Ventriculography.—In this procedure, introduced by W. E. Dandy, a needle is introduced through a small opening in the skull into one of the lateral ventricles (placed in a dependent position for the purpose) and alternate small quantities (20 c.c.) of cerebrospinal fluid withdrawn and air injected until somewhat more than the contents of the ventricle has been removed and replaced by an equal amount of air. In the X-ray picture subsequently taken the ventricle is sharply outlined. Dandy (Amer. Jour. of Roentg., Aug., 1923) had 3 deaths from this procedure in the first 100 injections, but none in the later 400. He now taps the posterior horns of both ventricles. Employing the method in 35 out of 97 suspected tumor cases, he was enabled, by the assistance in localization afforded by it, to reach the tumor at the 1st operation in 89 cases and at a 2d operation in 6 more, thus leaving but 2 instances in which the procedure proved misleading.

The opinion of most recent writers on ventriculography appears to be that while there are some tumors that cannot be localized by other means in which the procedure is of great value, the risk attending it precludes its use until other diagnostic methods have been exhausted. As noted by A. W. Adson, W. O. Ott and A. S. Crawford (Radiol., Feb., 1924), the ventriculogram aids in the diagnosis of cerebral tumors only when the lumen of the ventricle is encroached upon, and does not always localize small lesions of the frontal or temporal lobes, unless there is unilateral hydrocephalus. In small midline tumors above the tentorium, or in infratentorial tumors.

it reveals nothing more than obstruction of the aqueduct of Sylvius or 4th ventricle. Reporting on 75 cases of ventriculography performed at the Mayo Clinic, these observers divide them into a group of 47 cases without localizing signs and one of 25 cases with some slight suggestive sign of localization. In the other 3 cases the procedure had to be abandoned because no entrance could be obtained into the ventricle or no fluid withdrawn. In the 1st group the ventriculograms were positive in 29 cases, indeterminate in 16, and misleading in 2; in the 2d group, positive in 16 and indeterminate in 9. The localizations shown by the ventriculogram were verified by operative exploration or necropsy in 46 of the 75 cases. Of 33 operated cases, 3 were cured and 12 improved. There were 6 deaths within 30 hours after ventriculography—all but 1 in cases found inoperable on exploration.

A number of German observers, following Bingel, have been practising spinal insufflation of air, oxygen or ozone instead of dealing with the ventricles directly. In view of the known risks attending lumbar puncture in tumor suspects with increased intracranial pressure, American surgeons have been loath to employ such a procedure in these cases.

Ventricular Estimation.—This method, described by Dandy (Surg., Gyn. and Obst., May, 1923), is intended to avoid the serious risks attending air injection in advanced stages of intracranial hypertension with actual or impending coma. It consists in determining the position of the lateral ventricles by simple puncture; their size by measuring their fluid content, and the patency

of the communicating foramina of Monro by injection of a dye to be recovered from the ventricle of the opposite side. The average fluid content of each ventricle is about 25 to 30 c.c., though there is an extreme normal range of 15 to 40 c.c. Lateral displacement of both posterior horns suggests a growth in the posterior 1/2 of the hemisphere. Asymmetry of the 2 horns suggests displacement and compression by a tumor. A small ventricle on 1 side is evidence against a tumor in the posterior fossa. The smaller ventricle is usually on the same side as the tumor. Failure of the dye to enter the opposite ventricle means an obstruction at the foramen of Monro, pointing to a tumor of the anterior or middle, rather than the posterior, fossa. On the other hand, a bilateral symmetrical hydrocephalus suggests a growth in the posterior fossa. Dilatation of communicating ventricles means a tumor in or below the 3d ventricle. Five cases are reported in which this procedure proved of distinct localizing value.

Localization by the Electrode.—F. C. Grant (Jour. Amer. Med. Assoc., Dec. 29, 1923), an assistant to Frazier, has duplicated the apparatus and procedure of Meyer and Schlueter in employing the resistance of tissues to an electric current as a means of differentiating between normal brain and tumor tissue at the operating table. The apparatus comprises an audio-oscillator, 4 dry cells, a Kohlrausch bridge with sliding contact, a Wheatstone bridge, a low resistance telephone receiver, and a special electrode in the form of a glass or rubber needle embodying 2 platinoiridium wires, 1 of which

emerges at the tip of the needle and the other as a platinum band 1 cm. from the tip. The needle being inserted in the tissue under examination, the slide contact is moved up and down until the high-pitched hum from the oscillator, heard in the telephone receiver, reaches a minimum, at which juncture a reading of the resistance is made from a scale. The resistance in tumor specimens and in clinical tests nearly always proved very different from that in normal brain tissue, being usually much lower in the former than in the latter. The procedure proved of great value in cases where, upon exposing the brain, the operator found an apparently normal cortex and had to decide whether an incision through the cortex was warranted. method permits of locating a subcortical tumor without the risk attendant upon ventriculography.

TREATMENT.—Less has been made of late in the treatment than in the diagnosis of brain tumors. As stated by Elsberg (loc. cit.), however, if operative interference is resorted to early, when papilledema is of but slight degree, whether by removal of the tumor or decompression, blindness can be prevented in the majority of cases. As temporizing procedures other than decompression, during the study of a case, repeated lumbar punctures may be useful, but are not without danger. Concentrated solutions of sodium chloride, glucose or dextrose may be tried for temporary pressure relief, and likewise the use of magnesium sulphate solutions by the mouth and rectum, while waiting until localization of the growth becomes feasible. [See also preceding section: Intracranial Tension.] Frazier (loc. cit.) similarly directs attention to the value of magnesium sulphate as a substitute for decompression. Indeed, on account of the recent increase in the ratio of accurately localized tumors, the number of decompression operations has decreased in proportion, though such operations remain sometimes necessary previous to exploration and removal of the tumor.

Callosal puncture is being employed not infrequently by C. II. Frazier (Prog. Med., Mar., 1925), who deems it preferable in many instances to subtemporal decompression, avoiding the unsightly hernia which develops when there is an obstructive hydrocephalus. The period of patency of the puncture varies, but there is always the possibility of repeating the operation alternately on the 2 sides. It is performed under local anesthesia.

In regard to the operative removal of tumors, as yet successful only in a small minority of cases, Cushing (loc. cit.) refers to the unaccountable differences in the behavior of gliomas, some of which may be enucleated without recurrence, others are susceptible to radiation, others undergo complete cystic degeneration, while others still seem to grow more rapidly if disturbed in any way. In the case of the meningiomas, recurrence is always possible unless the growth is removed intact and along with it the entire dural area to which it has become attached.

In tuberculoma, even after an apparently complete enucleation, tuberculous meningitis or recurrence seems to be inevitable. In metastatic tumors in the brain, operation is generally futile.

As noted by H. S. Souttar (Lancet, Dec. 1, 1923), cysts offer an easier surgical problem than other kinds of tumors, the most important being those due to trauma, which may follow subdural or intracerebral hemorrhage and may remain latent for P. Martin (Arch. francovears. belges de chir., Sept., 1923), discussing 95 cases of cavity-forming gliomas, states that the average survival of 78 cases was 32 months, though 32 per cent. survived for 3 years, 23 per cent. for 5 years, and 6.7 per cent. for 10 years or more following evacuation of the cyst and treatment of its walls.

That a circumscribed scrous meningitis with cyst formation over the meninges and brain may cause symptoms of brain tumor is pointed out by R. Demel (Arch. f. klin. Chir., Sept., 1923). The cysts may become so large as to produce general pressure symptoms. In this condition spontaneous recovery may take place, or repeated lumbar puncture may bring relief. The most effective treatment, however, is drainage of the cyst and removal of its wall, which usually results in permanent cure.

D'Allocco (Policlin., Apr. 1, 1923) refers to a case of successful removal of a sarcoma from the Rolandic region, as well as to a number of cases in which, following a decompression operation, the autopsy showed that the tumors could in all probability have been successfully removed. He accordingly favors operative treatment in all cases.

Schloffer (Med. Klin., Jan. 8, 1923) records a case of large epithelioma of the parietal lobe illustrating the fact that after removal of a brain tumor loss of balance between the formation and absorption of cerebrospinal fluid may continue for a considerable period. In his patient lumbar punc-

ture was required on this account for 9 months after the operation.

Several reports on the radiation therapy of brain tumors have appeared of late. According to A. Béclère (Paris méd., Feb. 3, 1923), these tumors present 3 favorable features for such treatment in their slow growth, absence of metastasis, and the marked tolerance of the normal brain cells to radiation. Gliomas are amenable to the X-ray, while fibromas are not. After exclusion of syphilis, he advises trial of the X-ray previous to operation, except in urgent, neglected cases. It may also be used post-operatively. As for radium, it necessitates an open wound, extreme asepsis, and a precisely localized tumor. Gratifying results from the X-ray in pituitary tumors are reported. According to G. Roussy, S. Laborde and G. Lévy (Rev. neurol., Aug., 1924), who record 5 cases, the gliomas non-resistant to radiation are those made up of small cells. The difficulty of obtaining histologic information during life reduces the utility of the X-ray treatment. In their cases the dosage employed was 12,000 to 20,000 R units in each series of 3 or 4 treatments. In some cases the treatment had to be stopped because it induced coma, aggravated hemiplegia and cerebral hernia. These observers prefer not to employ radiotherapy until all that is possible has been obtained from operative procedures.

Percival Bailey (Amer. Jour. of Roentgenol., Jan., 1925), reporting on 242 patients treated with the **X-ray** for brain tumor, of whom 59 received 6 or more treatments, concludes that such treatment offers little hope of amelioration in cases of meningioma,

acoustic neuroma, or tumors of Rathke's pouch. Pituitary adenomas respond well to it, but it is not altogether without danger, and the visual fields should be carefully watched. At 3-week intervals the rays are directed to the pituitary fossa through 3 portals, viz., areas 31/2 inches square over the temporal bones and frontal region. A maximum skin dose is given at each sitting. Gliomas are sometimes very much improved by X-ray therapy, and every such tumor should be treated after an attempt has been made to remove it, where this attempt is deemed advisable; good results may thus be obtained in apparently hopeless cases. In the more superficial tumors a single port of entry is used, while in gliomas of the corpus callosum or pons, or other deep or midline growths, cross-fire from both sides is generally employed. In cerebellar cases this procedure is likewise often of value. The X-ray treatment of intracranial tumors should not be given blindly, but should wait upon as accurate a localizing and pathologic diagnosis as it is possible to make, even if operation be necessary to establish it.

That the therapeutic test for syphilis in brain tumor may lead one away from the proper diagnosis is pointed out by A. W. Morrison and J. C. McKinley (Jour. of Nerv. and Ment. Dis., Mar., 1924). Two cases found ultimately to have been suffering from glioma were given neoarsphenamin with the thought that they were instances of neurosyphilis. Improvement under the antisyphilitic treatment was so pronounced that no further consideration was given to the possibility of neoplasm. The

periods of benefit proved, however, to have been merely remissions, the relationship of the neoarsphenamin to which is difficult to say. Positive spinal fluid findings should be sought before making a diagnosis of neurosyphilis in this type of case.

BRANCHIAL CYSTS AND FISTULAS.—Whereas median congenital cysts and fistulas of the neck are derived from the thyroglossal duct, carrying epithelial cells with it from the floor of the mouth, the lesions more commonly termed branchial cysts or fistulas are lateral in position, and are regarded as usually derived from the thymopharyngeal duct.

According to studies by L. Baccarini (Arch. ital. di chir., ix, 279, 1924), however, these derivations do not cover all the cases of congenital neck cysts or fistulas. In 1 of his 11 cases the condition is ascribed to accidental inclusion of the ectoderm, in another to an inclusion of oral pavement epithelium in the thyroid anlage, and in a 3d to an unabsorbed remnant of cartilage of the 4th branchial arch. In 2 other cases the derivation was wholly obscure.

As noted by B. Lipshutz (Ann. of Surg., Apr., 1924), the patients with fistulas show a small skin opening yielding a serous or seropurulent discharge and frequently surrounded by a zone of eczema. In many of the lateral and at times in the median fistulas or cysts the tract can be palpated as a distinct cord coursing vertically in the neck. Bismuth injection for X-ray study or injection of methylene blue just before operation are serviceable procedures for determining the course of a fistula.

F. Christopher (Surg., Gyn. and Obst., Mar., 1924) directs attention to Wenglowski's studies of 78 embryos, numerous cadavers and 21 clinical cases of fistulas or cysts, which completely disproved the branchiogenic theory of the origin of these lesions. These studies showed that the branchial clefts or grooves in man are not open; the branchial apparatus cannot leave remnants in the neck below the hyoid; the vestiges of the thymic duct, running obliquely from the lateral pharyngeal wall to the sternum, may change into a lateral cervical fistula or cyst. The skin opening of a lateral cervical fistula is generally between the midline, the sternomastoid muscle, the hyoid bone and the sternal notch, rarely below the clavicle. from the annoyance of a periodic purulent discharge, such fistulas undoubtedly constitute foci of septic absorption and are a detriment to the general health.

TREATMENT.—As pointed out by Christopher, no one operation for excision can be recommended to the exclusion of others, each having its merits according to the obstacles encountered. To identify the tract during dissection the best method is to inject methylene blue with a blunt needle until the dye appears in the pharynx. A single vertical or slightly oblique incision over the fistulous tract is probably best. It should start with a small circular cut around the fistulous opening, which is then closed at once with a hemo-Blunt dissection of the taut tract is best, carried on, if possible, under the posterior belly of the digastric muscle, with avoidance of the hypoglossal nerve. Upon reach-

ing the pharynx, the freed tract should be divided between clamps about 2 cm. distal to the internal orifice and the proximal cut end cauterized. At this juncture the writer recommends the von Hacker maneuver: The proximal cut and cauterized end of the fistula is cautiously opened so as not to spill its contents, a probe bearing a ligature is passed through the fistula into the mouth, the ends of the ligature are made fast to the cut end of the fistula by transfixion, and the fistula is inverted into the pharynx by gentle traction on the ligature. The fistula is then ligated and cut off short, leaving in the pharynx a short stump which soon atrophies.

Where, as is occasionally the case, the fistula cannot be inverted even though wholly mobilized, its pharyngeal orifice is excised with a little of the adjacent mucosa and the latter closed with a purse-string.

In many instances the tract is so adherent from previous inflammation that it cannot be dissected out. In this event the Koenig operation should be employed, the freed distal end being passed through the oral mucosa in front of the tonsil and sutured there. This transforms the fistula into a curved sinus with a pharyngeal opening at 1 end and a buccal opening at the other, all external discharge being thus done away with.

BROMIDES.—POISONING.—A. S. Priddy (Therap. Gaz., Oct., 1924), writing from the State Colony for epileptics and feeble-minded in Virginia, asserts that most of the chronic epileptics admitted to the institution are found to be temporarily suffering as much from chronic bromism as from the disease itself. The practice of giving bromides indiscriminately and freely

increases the difficulty of treating these patients. The cumulative effect of their prolonged use contributes to the development of dementia; the immediate effects are mental depression and stupidity. O. S. Hubbard (*Ibid.*) has observed a few instances of acute mania apparently due to the use of bromide. One patient in particular on several occasions became violently excited under sodium bromide. E. A. Strecker (*Ibid.*) has seen periods of mild excitement with a large element of confusion and an indefinite hallucinosis, seemingly due to bromides.

A case of bromide eruption due to addiction to bromo-seltzer in a man aged 40 is reported by J. F. Waugh (Jour. Amer. Med. Assoc., May 17, 1924). The amount taken daily contained 25 to 126 grains of bromide, 10 to 54 grains of acetanilid and 3 to 14 grains of caffeine. The papulopustular eruption appeared in a few weeks, in addition to the bluish pallor of acetanilid intoxication and nervousness. The rash disappeared about 1 month after cessation of use of bromo-seltzer.

A bromide eruption in a nursing infant of 6 months is reported by F. H. Boone (Can. Med. Assoc. Jour., Aug., 1922). The mother, who was receiving 45 grains of sodium bromide a day, did not develop any eruption. The eruption in the child appeared 4½ weeks after the beginning of bromide medication.

Treatment.-Intravenous injections of 250 to 500 c.c. (1/2 to 1 pint) of decinormal sodium chloride solution at intervals of 2 to 3 days were observed by U. J. Wile (Arch. of Derm. and Syph., Sept., 1923) to yield marked benefit in the cases of 3 women with mental and cutaneous manifestations of bromism. The prompt appearance of bromide in the urine was evidence of the mass action of the chloride in displacing the bromide stored up in the tissues into the blood, thereby relieving the In 1 case acute bromide symptoms. nephritis and shock symptoms were observed, probably by reason of the sudden chemical change occurring in the tissues. The nephritis promptly cleared up when the bromide disappeared from the urine.

As stated by Hubbard (loc. cit.), epileptic patients who have taken much bromide should have the drug reduced slowly to

avoid status epilepticus. At the same time some other sedative may be substituted. Tonics, particularly strychnine, seem to help the stomach and circulation. Much attention should be given to the stomach and bowels, and frequent warm baths administered.

BRONCHI. - FOREIGN BODIES.—SYMPTOMS.—The symptoms at the time of inspiration of a foreign body, as described by T. McCrae (Lancet, Apr. 12, 19 and 26, 1924), vary greatly. They are usually marked if the foreign body remains in the trachea, and especially if it is movable. Sometimes, however, there are no symptoms. Infants and young children generally react more severely. Foreign bodies in the trachea cause dyspnea, cyanosis and cough, usually paroxysmal; generally there is a loud wheeze, and on auscultation the breath-sounds are harsh and loud. Foreign bodies in the bronchi cause disturbances varying with their size, shape and character. If a bronchus is plugged completely, there results pulmonary collapse and increase of fluid content. If air can pass in but not out, obstructive emphysema results. In partial blocking of the bronchus, there is usually decreased expansion on the affected side, with diminished vocal fremitus and rough breath sounds. The physical signs are apt to change from hour to hour. Acute cases are usually caused by foreign bodies of a vegetable nature; the symptoms are severe, toxemia often being very marked. These cases are generally confused with diphtheria and pneu-Direct laryngoscopy, cultures, and careful clinical and X-ray examinations of the chest should be carried out. Foreign body should

be considered in every case of respiratory disease showing unusual features. A negative history does not always rule it out, and the symptomless interval after the initial symptoms is responsible for many mistaken diagnoses. Cases with chills, fever and a rapid pulse and respiration are likely to be regarded as influenza or pneumonia.

Where there has been much irritation, coarse râles are heard on both sides of the chest. Subglottic swelling is common, causing hoarseness and a croupy cough. A safetypin causes but few changes, and the obstruction may be so slight as not to produce any local signs in the lung. On the other hand, a peanut induces intense inflammation; the swelling of the mucosa may completely close the bronchus, and secretions may even pass to the opposite side and cause signs there. Pneumothorax sometimes occurs in very acute cases, presumably due to rupture of an air-vesicle in severe coughing. Blood in small amount may be brought up soon after aspiration of the foreign body.

In cases of long duration, abscess formation, bronchiectasis and fibroid changes are eventually to be expected, and the general health suffers. Empyema has occurred in a few cases. Profuse bleeding is the rule when a foreign body has been in the lung a long time.

L. H. Clerf (U. S. Naval Med. Bull., July, 1923) comments upon a relative increase in the number of foreign body cases of dental origin submitted for bronchoscopy. Among 12 cases involving artificial dentures, 1 denture lodged in the left bronchus and 11 in the esophagus. Portions of a crushed tooth or an entire tooth may be

aspirated during exodontia. The almost general use of the upright position, with the stertorous breathing under anesthesia, especially nitrous oxide, are of etiologic importance, though in 1 out of 10 cases a local anesthetic had been used. In 3 cases gold tooth crowns were accidentally lost and extracted from the bronchi by bronchoscopy. Other bodies aspirated into a bronchus comprised broach canal reamers, amalgam fillings, orthodontic appliances, and a 3tooth gold bridge. In dental work, if, in spite of precautions, there is any question about the loss of a tooth, appliance or filling, careful X-ray examination from the nasopharynx to the tuberosities of the ischia should be immediately insisted upon.

DIAGNOSIS. —Aside from the diagnosis of foreign body on the basis of the symptoms and physical signs, X-ray examination is obviously of service in the case of bodies opaque to the X-ray. Even in this connection, however, errors may occasionally arise through misinterpretation of suspicious shadows. P. P. Vinson (Amer. Jour. of Roentg., Nov., 1923) reports 3 such cases. In 1 case of many years' standing, the X-ray diagnosis was collar-button in the right descending bronchus, but neither bronchoscopy nor subsequent repeated X-ray examinations showed the shadow present in the 1st plate, and it was suggested that the shadow was a fibrous cast of the collar button which was broken up during the dilatation of the cicatrix at the bronchoscopy, the collar button itself having been of such composition that complete disintegration had taken place. In the 2d case the pin located in a bronchus at the 1st X-ray examination is thought to have really been in a towel covering the patient, not being visible at any subsequent ex-

amination. In the 3d case a staple swallowed 4 days previously was supposedly located by X-ray in the right bronchus, but was later found in the ascending colon and passed by rectum the next day.

In the case of foreign bodies not opaque to the X-ray, such as peanut kernels, the ray may nevertheless be useful in diagnosis, as pointed out by W. F. Manges (Surg. Clin. of No. Amer., Feb., 1924). In such cases the X-ray evidences depend upon altered mechanics of the air passage due to the foreign body, plus the pathologic changes in the immediate vicinity and the distal bronchial ramifications. These factors are, in succession, obstruction, exudation, infection, and displacement with malfunction of the viscera. Usually expiration is affected more than inspiration. with resulting obstructive emphysema on the affected side. If, however, the trachea is considerably obliterated by the foreign body and mucosal swelling, both lungs show signs of the obstructive emphysema, the diaphragm on both sides being lower at expiration than at inspiration, and the heart assuming a more vertical position at expiration. Exposures both at full inspiration and expiration should be made. When a foreign body completely obstructs a Lronchus, the air distal to it soon becomes absorbed, with collapse of the distal portion of the lung and rather severe dyspnea when a considerable portion of this organ is involved.

Similarly, Texier and Levesque (Ann. des mal. de l'or., du lar., etc., Dec., 1923) describe the X-ray syncrome of bronchial obstruction by non-opaque foreign bodies as follows: (1) Displacement of mediastinal organs, continuously or only with inspiration; (2) reduced diaphragm excursions on the affected side; (3) altered transparency of the lung, in proportion to the degree of obstruc-The displacement of the mediastinal organs, particularly the heart and great vessels, toward the affected side results from the partial collapse of the lung of that side. In an illustrative case in a child of 2 years, both the mediastinal displacement and reduced excursions were very evident, though there was no opacity of the lung. There were also slight inpulling of the lower ribs on the affected side, and râles all over the chest, worse on that side.  $\Lambda$ piece of roasted chestnut was removed from the right bronchus.

In a case reported by P. P. Vinson and C. G. Sutherland (Radiol., Dec., 1923), a young woman, after an automobile accident, had for a number of months had coughing spells productive of yellowish mucus and several marked lung hemorrhages. Ultimately, after the lung symptoms had been relieved, a foreign body was seen on several occasions with the rays and removed from a primary bronchial division, proving to be a thin piece of glass, apparently from the windshield of the automobile.

E. Halphen (Bull. Soc. méd. des hôp. de Paris, Jan. 26, 1923) reports the successful removal of a foreign body which had been producing symptoms simulating chronic bronchitis. The muco-purulent secretion proved a guide to the location of the body during bronchoscopy.

TREATMENT.—Foreign bodies entering the trachea or bronchi are seldom expelled spontaneously. Practically all objects can, however, be removed by skilled hands. As noted by McCrae (loc. cit.), when the foreign body is a nut the prognosis

is serious even after careful removal. Efforts to favor removal by inverting the patient are contraindicated on account of the risk of impaction of the foreign body in the glottis. As to tracheotomy no set rules can be laid down; it is better to do several possibly unnecessary tracheotomies than to lose a patient through delay. The cases should be thoroughly studied, however, unless the condition is very acute and serious and due to a vegetable substance.

H. Dietrich and H. K. Berkley (Jour. Amer. Med. Assoc., Oct. 6, 1923) quote Chevalier Jackson to the effect that almost any localizable foreign body that has gone down the natural passages can be removed by bronchoscopy. Jackson reports 98.3 per cent. of recoveries. The risk of a brief, careful bronchoscopic examination is almost *nil*.

In a case reported by Vinson and Sutherland (Radiol., Feb., 1924), fluoroscopic guidance proved helpful in the removal of the foreign body—a shingle nail aspirated 14 years before, which ultimately caused pulmonary hemorrhages sufficiently severe to lead the patient to seek relief. The first attempt at removal failed because the nail was embedded in a dense stricture. At the 2d attempt local anesthesia was instituted and under fluoroscopy forceps were pushed through the stricture and the foreign body readily removed.

TUMORS.—The increasing frequency with which malignant tumors of the bronchi are being diagnosed during life by bronchoscopy is commented upon by D. C. Greene (Laryngosc., Feb., 1924). In his case of carcinoma of the left primary bronchus in a young woman of 19, radiography showed increased density and massive collapse of the lung

owing to bronchial stenosis, together with displacement of the trachea, heart and aorta to the affected side. There were intercurrent attacks of acute inflammation in the lung. Radium seeds were implanted in the tumor, followed by high voltage X-rays. At operation, the mass was seized with biting forceps through the bronchoscope and much of it removed. As a result of treatment, the patient was freed of all special symptoms except a slight cough. H. B. Orton (Ibid.) reports a case of removal of a small carcinoma measuring 11/4 cm. in its longest diameter from the right bronchus. The patient, a man aged 29, had had hoarseness and cough for 2 years, and the X-ray revealed an abscess at the base of the right lung. Upon operation the chest cleared up and a later bronchoscopy showed no recurrence of the tumor.

In 15 cases of primary bronchial cancer reported by Camp (Med. Klin., Sept. 14, 1924), cachexia had been uniformly absent as an early feature, but often a blood-stained sputum had been noted. All of these cases were in males.

Total pneumectomy of the left lung for cancer of the bronchus in a woman of 56 years is reported by R. Hinz (Arch. f. klin. Chir., Apr. 12, 1923). The patient died of pulmonary emphysema on the 3d day, but the operation is nevertheless deemed to have been warranted in this case. The writer found in the literature 9 cases of partial pneumectomy, of which 5 survived the operation.

BRONCHIECTASIS.—SYMPTOMS.—As emphasized by F. Bezançon, M. P. Weil, R. Azoulay and E. Bernard (Presse méd., Feb. 20, 1924), copious expectoration is not a

necessary feature of bronchiectasis, which they do not regard as being always secondary to chronic bronchitis or bronchopneumonia, but rather a primary disorder, often of unaccountable origin. As in 2 cases observed by the writers, bronchiectasis may be manifested mainly in repeated hemoptysis without expectoration. No tubercle bacilli were found in these cases. In 1 case the customary signs of bronchiectasis with profuse expectoration appeared, however, when the patient was exposed to influenza cases. The hemorrhage in bronchiectasis is occasionally fatal. The condition may date back to infancy, or even be congenital, or, when latent, may be brought into activity by pneumonia, influenza, measles or whooping-cough; asphyxiant gases are also a cause.

> In a case reported by H. A. Bray (Amer. Rev. of Tub., Jan., 1923), evidences of localized tuberculosis at the base of the left lung had been present for 7 years, but the sputum showed no tubercle bacilli. Suspicion of bronchiectasis was fostered by the clubbed fingers, slight cyanosis, absence of general physical deterioration and negative X-ray examination. suspicion was later confirmed by the advent of an actual acute phthisis, with a manifest contrast in the clinical picture and physical and X-ray findings.

DIAGNOSIS.—The difficulties met with in differentiating apical bronchiectasis from tuberculosis are dwelt on by A. Bauer (Beit. z. Klin. d. Tub., Nov. 1, 1923). The symptoms, physical signs and radiogram may all suggest tuberculosis when it does not, in fact, exist. On the whole, a negative tuberculin test and prolonged observation of the case are the best means of differentiation.

Hedblom (Surg., Gyn. and Obst., June, 1924) alludes to an important sign of bronchiectasis described by Lemon, *viz.*, the ability of the patient to produce sputum at will by assuming a head-down position.

Attention has recently been called by several French observers to the utility of lipiodol, a vegetable oil containing 40 per cent. of iodine, for the X-ray diagnosis of bronchiectasis. Sicard having first used lipiodol for the localization of spinal cord tumors, Forestier suggested its employment in bronchopulmonary disorders. E. Sergent and P. Cottenot (Bull. de l'Acad. de méd., Jan. 22, 1924), alluding first to the deficiencies of ordinary X-ray study in bronchiectasis, pointed out that after intratracheal injection of lipiodol bronchial dilatations are plainly pictured. procedure proved valuable in distinguishing cavities formed by a dilated bronchus or communicating widely with a bronchus, as in bronchiectasis or peribronchial abscess with destruction from the bronchus outward, from cavities that have opened only secondarily into bronchi, as in lung abscess or pleural cavity, from which the lipiodol usually cannot pass into the bronchus through the narrow fistula formed.

Armand-Delille, Darbois, Duhamel and Marty (Bull. Soc. méd. des hôp. de Paris, Dec. 6, 1923) report good results from lipiodol injections in several cases of dubious bronchiectasis in children. No untoward effects were noted. The procedure was preceded by the giving of 0.005 Gm. (½2 grain) of morphine and intratracheal injection of 2 or 3 c.c. (32 to 48 minims) of 1 per cent. procaine solution. In a later article, Armand-

Delille, Duhamel and Marty (Presse méd., May 14, 1924) describe the use of a curved trocar and cannula to be passed into the trachea through the cricothyroid space under local anesthesia; 5 c.c. (80 minims) of 1 per cent. procaine are then injected into the trachea, followed by lipiodol to the amount of 8 to 10 c.c. (128 to 160 minims) in children of 7 to 14 years. Only 3 c.c. of lipiodol per minute are injected. The X-ray exposure immediately follows the injection. Aside from the distinction between bronchiectasis and tuberculosis, interlobar pleurisy or lung abscess, the procedure may also be serviceable in suspected subphrenic abscess to determine whether the pus is below or above the diaphragm. In some instances the introduction of lipiodol also acts favorably in relieving cough and expectoration.

Bezançon, Weil, Bernard and Azoulay (Bull. Soc. de rad. méd. de France, Feb., 1924) report 2 cases in which the diagnosis was completely in doubt until the lipiodol method was used. Repeated hemoptysis without expectoration or tubercle bacilli had occurred, and the clinical evidence had suggested fibroid phthisis. The X-ray picture of bronchiectasis with lipiodol exhibits groups of small, cup-like structures combined like sigmoid valves or series of small cavities connected by a bronchial channel.

According to Armand-Delille and A. Moncrieff (Brit. Med. Jour., July 5, 1924), bronchial dilatation even of slight degree is definitely shown by lipiodol. The curved trocar and cannula used are of about 1.5 mm. diameter and fitted, like a tracheotomy tube, with tapes for tying

around the neck. The lipiodol is sterilized in a water bath. By turning the patient to 1 side the bulk of the oil can be caused to flow into 1 or the other lung, if desired. The procedure should be avoided in cases of frank tuberculosis, as the congestive action of the iodine may be harmful.

Chevalier Jackson (Trans. Amer. Acad. of Ophth. and Otolar., 1923) notes that in a well-marked case bronchiectasis can readily be observed by bronchoscopy, the bronchial dilatations alternating with contractions, with the walls chronically inflamed, possibly eroded or ulcerated and smeared with foul pus. In doubtful cases bismuth subcarbonate may be insufflated through the bronchoscope and a stereoroentgenogram made.

TREATMENT.—In localized bronchiectasis in the lower pulmonary lobes, H. Schaefer (Klin. Woch., Feb. 5, 1923) obtained excellent results from postural treatment. After the usual discharge of sputum every morning, the patients remained in the horizontal position for 2 hours. Later the foot of the bed was raised 30 cm. (12 inches) in addition, to enhance the detergent action of gravity. R. Weinberger (Wien. klin. Woch., Oct. 9, 1924) reports a case in which this partly inverted position was employed to a gradually increasing degree for several hours daily, with good effects. In this case artificial pneumothorax had aggravated the condition.

N. Parise (Rif. med., Aug. 11, 1924) observed pronounced betterment in 2 cases from intratracheal injections of a solution of gomenol, 5 Gm. (75 grains); guaiacol, 4 Gm.

(60 grains); camphor, 2 Gm. (30 grains), and iodoform, 1 Gm. (15 grains), in 100 c.c. (3½ ounces) of sterile olive oil. A syringe with a curved tip, to be passed into the larynx, was used. Entrance of the solution into 1 lung, as desired, is insured by having the patient lie on that side.

A review of 65 cases treated by artificial pneumothorax, including 5 personal cases, is contributed by J. Tillman (Acta med. scand., Oct. 4, 1923). Improvement or recovery resulted in about 3/3 of the cases. In 3 of the writer's cases the pneumothorax was only partial, but much betterment resulted in 2 and recovery in 1. In another case lung collapse was maintained for 6 years, with resulting great reduction of sputum and disappearance of its odor. In 61 per cent. of the total of 65 cases the disease was known to be unilateral and in 18 per cent., bilateral. Attempts at bilateral pneumothorax were not successful. The exact indications for artificial pneumothorax in bronchiectasis cannot as yet be definitely stated.

Surgical treatment for bronchiectasis has been advocated of late by several observers. C. A. Hedblom (Arch. of Surg., Jan., 1924) reports 10 cases of diffuse unilateral bronchiectasis treated by extrapleural thoracoplasty, which was performed in 4 to 7 stages under nitrous oxideoxygen anesthesia, followed by alcohol injection of the intercostal nerves. There were no deaths, and 6 cases were restored to good general health, 3 being practically free of symptoms, while 3 still raised 30 to 60 c.c. of sputum in the 24 hours. The same observer (Surg., Gyn. and Obst.,

June, 1924) describes the operation as he performs it as a subperiosteal resection of the whole length of the 3d or 4th to the 11th ribs, in 6 stages. Its object is permanent collapse of the diseased portion of the lung. Posterior resection is performed 1st because it produces the greatest relative amount of chest collapse and gives access to the proximal portion of the intercostal nerves, which are injected with 95 per cent. alcohol; the resulting anesthesia for many weeks is of importance when a series of 5 or 6 operations is to be performed. Eight to 10 centimeter segments of the anterior extremities are next resected to the costochondral junction. The remaining lateral segments may be reached by a straight incision in the axillary line. The posterior, lateral, and anterior resections are performed usually each in 2 sittings. The different stages are performed at intervals of about 7 days. Gravity evacuation of the secretions every 3 or 4 hours, beginning immediately after operation, is important. In 11 cases under observation 6 months to 3 years after operation, the decrease in sputum averaged 75 to 100 per cent. Except 1 case with actinomycosis, all showed lasting general improvement.

P. Santy and M. Guilleminet (Lyon chir., Mar.-Apr., 1924) like-wise consider extrapleural thoracoplasty a rational procedure. They perform the complete operation at 1 sitting. It is not indicated in children. The benefit from it appears gradually.

Lobectomy is deemed by E. A. Graham (Arch. of Surg., Jan., 1923) the only procedure offering a chance of complete relief from all symptoms

in advanced cases. Among the total of 48 cases on record, however, there were only 17 per cent. of complete successes, and an operative mortality of 52 per cent., chiefly because of infection due to the preliminary freeing of adhesions. To avoid this danger, Graham (Jour. Amer. Med. Assoc., Sept. 22, 1923) has described a modified lobectomy performed with the actual cautery. This was carried out clinically in 3 cases without mortality or serious reaction. At the 1st operation a flap of skin and muscle is turned up and portions of several ribs removed. Thereafter, in as many stages as desired, without any need of anesthesia, all the diseased tissue is removed by successive evacuations with a large soldering iron, heated to a red heat, into the lung tissue. In 1 case nearly all of 1 lung was thus removed. The remaining eschar sloughs away in about 10 days. No trouble from hemorrhage was experienced. The cavity and bronchial fistulas gradually obliterate themselves. Healing is hastened by heliotherapy.

BRONCHITIS.—ACUTE.—Sir Thomas Oliver (Brit. Med. Jour., May 3, 1924) deems it probable that at times the surface tension of the tissue cells becomes lowered, thus permitting germs to break through the barrier, become intracellular, and induce disease. Some Gram-negative microbes, indeed, are believed capable per se of lowering the surface tension. Either because of atmospheric conditions or infection, germs other than those of which the persons are carriers may fix themselves on the nasorespiratory mucous membrane and induce a type of catarrh peculiarly their own, which then descends into the bronchi. An unusual type of bronchitis in an elderly man is reported, featured by low temperature without signs of physical depression and a gelatinous sputum, at times dislodged with much difficulty and pain. The accumulated sputa appeared as a clear, yellow jelly, as if stained with picric acid. color was found due to Sarcina flava. Pneumococci were also present, perhaps accounting for the jelly-like sputum. In the stage of decline there were attacks of dyspnea due apparently to bronchospasm, though no evidences of asthma were present.

TREATMENT. -According to Sir James Barr (Med. Jour. and Rec., Apr. 16, 1924), the view that bronchitis is merely a secondary disease, infection travelling down from the nose, throat, sinuses, tonsils or teeth, is being carried too far. All the pathogenic flora of the upper air passages are common in warm, dry climates, but bronchitis is rare. A chill due to exposure is an undoubted etiologic factor, but more particularly if the atmosphere is moist as well as cold. When the vital resistance is lowered, and especially during sleep when the controlling influence of the nervous system is partially suspended, one is much more liable to the catarrhal effects of cold. In a cold, damp climate many aged persons contract a fatal bronchitis in bed. The writer has seen a bronchitic patient, with edema of the lungs and the so-called death rattle in his throat, rescued from death by rapidly raising the temperature of his bedroom with a blazing

Many cases of acute bronchitis could be aborted or cut short by

prompt, energetic treatment. person with a severe chill followed by distress in breathing should have a warm mustard bath, be put to bed in a warm room, and if he still feels chilly, have a glass of hot punch or some hot gruel. No food should be given for 24 hours, but plenty of hot water allowed. Reid's panacea of Dover's powder with acetylsalicylic acid and acetphenetidin may be given. Next morning a saline purge should be given, and the patient then remain in bed for 2 or 3 days on a starvation diet. In cases where the lungs have become waterlogged, the sympathetic is insufficiently active and the vagus overactive; hence, atropine, ½0 grain (0.0012 Gm.), and adrenalin solution, 5 to 10 minims (0.3 to 0.6 c.c.), should be given intravenously every 2 hours until the danger is past. As free calcium ions in the blood are practically always deficient, soluble calcium hypophosphite, 2 or 3 grains (0.13 to 0.2 Gm.), should be added to each injection, and a liberal supply given by the mouth. The atmosphere should be warm—about 70° F.—and as dry as possible, large amounts of dried calcium chloride or strong sulphuric acid being placed in soup plates about the room. There is no need for food, and the quantity of fluid should only be sufficient to moisten the lips and mouth. Blood-letting is inadvisable in these cases.

In acute bronchitis in children, G. Vidal Jordana (Arch. españ. ped., Sept., 1924) applies treatment as for bronchopneumonia, with the result of frequently preventing the latter. The patient is kept in a moist atmosphere at 18 to 20° C. (64.4 to 68° F.), permeated with simple balsamic

fumes. A combination of sodium benzoate, senega and citrated caffeine is given, but no antipyretics. Counterirritation, usually with mustard, is employed, and frequently wet cups. In spasmodic bronchitis ether injections are given. Injections of sterile milk are sometimes availed of. For fever, hydrotherapeutic measures are used if required.

AMEBIC.-An amebic form of bronchitis is described by Petzetakis (Bull. Soc. méd. des hôp. de Paris, Aug. 3, 1923), who had been struck by the favorable effects of emetine in overcoming certain cases of atypical bronchitis, some of which had a history of dysentery. Hemoptysis occurred in these cases, and the sputum was viscid and mucoid, and showed amebæ and amebic cysts. The condition occurs independently of any pulmonary or hepatic abscess. The same writer (Ibid., Nov. 8, 1923) notes that in the patients who did not have a history of dysentery the stools were always negative for amebæ. Under emetine treatment, preferably intravenous, the amebæ gradually disappear from the sputum.

CHRONIC.—Chronic bronchitis is classified by J. B. Hawes, 2d (Boston Med. and Surg. Jour., Aug. 2, 1923) as primary, including bronchitis due to irritants such as cotton, flour or other dust, and gouty bronchitis, and secondary, including cases secondary to an infection in the upper respiratory tract, cases following some acute pulmonary infection, and bronchitis following gassing in ex-service men. In addition, there are many cases of wrong diagnosis, in which the symptoms are due either to a weak heart with congestion or edema, bronchiectasis, or interstitial pneumonitis.

In regard to the early stages of chronic bronchitis, C. N. Meader (III. Med. Jour., Sept., 1924) states that no constant X-ray picture is found, the commonest change, however, being an accentuation of the normal lung markings, particularly of the smaller bronchial divisions, usually to a different degree on the 2 sides, sometimes with small areas of relative opacity in the surrounding parenchyma, denser than the fluffy areas of early tuberculous in-Physical signs of hilus filtration. gland enlargement are frequent, but not always confirmed by the X-ray. Probably chronic bronchitis, peribronchitis and pneumonitis are present in varying degree in different cases which are clinically much the same. In a study of 26 such cases, the writer found a rather even distribution of the incidence by decades from 5 to 65 years. The onset was insidious in 15, and followed an acute illness in 11. Five had no foci of infection; 13 had infected tonsils; 12, nasal sinus infection; 9, apical dental infections, and 6, infections in the appendix, prostate, gall-bladder or middle ear. The treatment comprised general hygienic measures to enhance resistance, removal of foci of infection, and autogenous vaccines.

Chronic bronchitis of nasal origin is emphasized by W. F. von Zelinski (Med. Jour. and Rec., Feb. 6, 1924). The persistent cough is usually accompanied by more or less obstruction to nasal breathing—"the bronchitis of the corked nose." These patients virtually blow their nose into the pharynx, infecting the lymphatics of the latter, as well as the larynx and trachea. The most frequent sources of infection in his cases were,

in order: Chronic purulent ethmoiditis, adenoids, maxillary sinusitis, chronic purulent sinusitis, and pansinusitis. He recognizes 3 types of cases: (1) Infection spreading equally through the main branches of the bronchi and to the alveoli, sometimes with dilatation of the bronchioles and physical signs of emphysema, cough increased in damp, cold weather and by lying down, with hawking, coughing and sometimes profuse expectoration on arising. (2) Tracheal or phlegmonous type, with severe, painful paroxysms not unlike asthma, followed by moderate expectoration, the cough being accompanied by substernal pain. Localized form, with involvement of the lungs in patches, at times only a small spot, frequently near the apex; clearing up of the physical signs after brief local and general treatment assists in the differentiation from tuberculosis; the writer's cases of this type showed maxillary sinus infection.

Chevalier Jackson (Jour. Amer. Med. Assoc., Dec. 6, 1924) reports 2 cases of ulcerative, pseudomembranous bronchitis due to Vincent's organisms. in which the bronchial lesions were observed bronchoscopically. The 1st case had failed to recover after Vincent's angina, developing fever and a cough, with offensive, occasionally blood-streaked sputum, Lung expansion was somewhat limited, with a great variety of râles. Bronchoscopy showed both bronchi affected. Much secretion was aspirated and applications of 20 per cent. silver nitrate were made at 6 later bronchoscopies, complete recovery following. In the 2d case an abscess of the lung had been suspected, but bronchoscopy showed the left bronchus occluded by whitish material which came away with forceps in several casts, leaving ulcerated surfaces. Much foul pus was aspirated. The casts showed predominance of Vincent's organisms. The patient went to sea without further treatment, and later stated his cough and expectoration had ceased in about a month. Vincent's infection should be excluded in every case of ulcerative or membranous bronchitis or chronic lung suppuration.

TREATMENT.—Reduction of fats and carbohydrates in the diet to the minimum requirements is advised by Sir James Barr (loc. cit.), but a free allowance of nitrogenous food is to be made. Vaccines have assumed the most prominent position in prevention and treatment. An autogenous vaccine is best if the swab can be taken by the bacteriologist and immediately applied to the culture medium; otherwise a stock vaccine may be preferable. The deficiency of lime salts often existing when the expectoration is abundant and albuminous is met by giving soluble lime salts, especially calcium iodide, with milk and gelatin in the diet. When expectoration is scanty and tough, however, with much bronchial spasm, decalcifying agents are indicated, as also in cases with rigid costal cartilages. The iodides and preparations of iodine and thyroid are very useful in the spasmodic or asthmatic type. For troublesome cough, paregoric or opium and antimony are useful. After the acute stage, apomorphine and strychnine make a good tonic expectorant. In asthmatic attacks, speedy relief is usually obtainable by percussion between the 4th and 5th cervical vertebræ and on the 2d dorsal. If the heart is dilated and its action labored, the 7th cervical and 2d dorsal vertebræ should be percussed. In these procedures the writer places a large cork over the interspace and spines and taps it gently 30 times with a 1½ ounce mallet; this is repeated twice after intervals of 1 minute.

An infusion of 1 Gm. (15 grains) of pilocarpus leaves—about 1 level teaspoonful—is administered 3 times a day by Mahlo (Münch. med. Woch., Dec. 21, 1923) to excite a more liquid bronchial secretion in bronchitis and asthma without expectoration.

In gouty bronchitis, with hard, dry cough and dry râles in plethoric, overweight subjects with increased blood-pressure, Hawes (loc. cit.) reduces the diet by at least 1/3, meat being prohibited except once or twice a week and salt and condiments reduced to a minimum. Water, 10 to 12 glasses, is taken daily and the bowels kept open with a saline laxative. Potassium iodide, taken regularly for 2 or 3 weeks, then every other week, and finally 1 week in every month, is of distinct benefit. Oil sprays or, occasionally, steam inhalations alleviate the cough paroxysms. Exercise, such as walking, riding or golf, is most important. As with most other cases of chronic bronchitis, cold air at night should be avoided.

Patients with post-influenzal bronchitis need most of all encouragement, iron, rest and particularly a change, even if only a short distance away, where business and housekeeping cares can be left behind.

In chronic bronchitis following gassing there is often considerable peribronchial thickening; otherwise the pathology is uncertain. Many patients are nervous and apprehensive, and need a frank, encouraging talk; some need a severe talking-to and to be urged to go to work. They are often helped by potassium iodide, occasionally with belladonna, if expectoration is profuse. Large amounts of water and free bowel movements are required. Wind and dust and cold at night are especially harmful. The coughing habit may be broken up by bromides as a temporary measure.

When possible, as noted by R. A. Young (Lancet, Nov. 29, 1924), bronchitic patients should move from cold, damp, foggy places to those with an equable, dry, sunny climate, free of cold winds. Where this is impracticable, a change of local residence or of occupation may be helpful. Aside from precautions as to clothing and diet and the use of vaccines, the medicinal treatment varies with the type of the condition. In the common winter cough or chronic tracheobronchitis, a simple expectorant mixture to take occasionally may be all that is necessary:

```
B. Vini ipccacuanhæ. mx (0.6 c.c.);

Syrupi scillæ .... f5j (4 c.c.);

Tinct. opii camph. mx (0.6 c.c.);

Aquæ chloroformi,

q.s. ad ...... f5j (30 c.c.).—M.
```

Where cough is irritative and ineffective, a dose of the following mixture taken in hot water may be helpful:

```
B. Sodii bicarb. ... gr. x (0.6 Gm.);

Sodii chloridi ... gr. iij (0.2 Gm.);

Spts. chloroformi. m v (0.3 c.c.);

Aquæ anisi, q.s. ad f5j (30 c.c.).—M.
```

In cases with marked tracheitis, small doses of apomorphine—1/36 to

 $\frac{1}{20}$  grain (0.0018 to 0.003 Gm.)—are often very useful. In more severe cases with asthmatic dyspnea or copious mucopurulent sputum, a valuable mixture is:

```
B. Potass. iodidi,
Ammon. carb., .āā gr. iij (0.2 Gm.);
Potass. bicarb. .. gr. x (0.6 Gm.);
Tr. stramonii ... m v-x (0.3-0.6 c.c.);
Syr. tolutani ... f5j (4 c.c.);
Aquæ chloroformi,
q.s. ad ..... f5j (30 c.c.).—M.
```

In bronchorrhea, atropine, belladonna, acids and vaccines may be In dry catarrh with painful cough, the 2d formula given above, with iodides, acts best. Codliver oil, with or without malt, is often helpful, especially in thin, spare individ-For retrosternal soreness or muscular pain from coughing the acetic turpentine liniment (Lin. Tercb. Acet., B. P.) is one of the best, but other stronger liniments or iodine ointments are often useful. In complicating acute bronchitis, the patient should at once be put to bed, however mild the attack may appear at first, saline expectorants, diaphoretics and stimulants given if necessary, and the physical signs watched. Tuberculosis should be suspected in cases in which the summer intermission suddenly ceases.

In chronic bronchitis of nasal origin, as stated by Von Zelinski (loc. cit.), every abnormal condition of the nasopharynx and sinuses should receive treatment. Vaccines are of distinct value, in particular the autogenous variety, and potassium iodide is definitely helpful. Inhalations of benzoin, eucalyptol, menthol, creosote, turpentine, etc., are of some slight value. For the control of cough, if not productive, codeine in

0.03 to 0.06 Gm. (½ to 1 grain) doses is best. Sometimes the bromides in 1 to 2 Gm. (15 to 30 grain) doses prove effective. These drugs should be used sparingly, in particular to prevent loss of sleep. Many patients can be taught to control their cough by the exercise of will power. A productive cough should not be suppressed. As an aid the writer found nothing better than potassium iodide and ipecac in some 1 of its fluid forms and in the highest tolerated doses. In cases with asthmatoid attacks he uses lobelia or belladonna with potassium iodide or bromide or both. Cold sponging of the chest on arising, the breathing and bodybending exercises described in drill manuals, and open air sports in proper weather are of benefit.

In a case reported by A. Sézary (Bull. Soc. méd. des hôp. de Paris, Apr. 13, 1923), the patient was a man who had been gassed and later suffered from bronchitis and attacks of unconsciousness following cough. These attacks ceased under treatment with belladonna.

Concerning vaccine treatment in bronchitis, opinions vary. (loc. cit.) deems it overrated, and uses it as a last resort. J. O. Symes (Brit. Med. Jour., Dec. 15, 1923), on the other hand, considers it the most potent means of curing and ameliorating, as well as of preventing, chronic bronchitis. He uses autogenous vaccines; stock vaccines are not likely to meet with more than a modicum of success. Care in preparation of the vaccine is of the greatest importance. The treatment must be continued at least 3 months, although the immediate symptoms may have ceased, the object being to establish a high degree of resistance. The intervals between the early tentative doses should be 5 days; when reaction has been established this may be lengthened to 7 days. Gradually cough and expectoration should entirely disappear. with an associated bronchiectasis benefit the most. Preferably a new vaccine should be prepared at least once during a 3-months' course, as certain of the original organisms may have died out or fresh varieties supplanted them. In a given patient the bacteriology of successive winter recurrences is seldom identical, so that it is of no use to rely for treatment on a vaccine founded on past experiences.

Postinfluenzal bronchitis, according to Hurwitz (Cal. and West. Med., Dec., 1924), is due to secondary infection of a congested, edematous bronchial mucosa, chiefly with 4 types of streptococci. Treatment with carefully prepared and correctly administered autogenous vaccines containing these organisms for a varying period yielded results after failure of all other measures.

Good effects are reported by N. Parise (Rif. med., Aug. 11, 1924) in 6 cases of chronic bronchitis and 2 of fetid bronchitis from intratracheal injections, administered with a syringe with curved nozzle to be passed into the larynx, of gomenol, 5 Gm. (80 minims); guaiacol, 4 Gm. (60 minims); camphor, 2 Gm. (30 grains), and iodoform, 1 Gm. (15 grains), in 100 c.c.  $(3\frac{1}{3})$  ounces of sterile olive oil. E. Fronticelli (Policlin., June 16, 1924) similarly records 2 cases of recovery from fetid bronchitis in less than a month following intratracheal injections of thick oils, with or without iodoform.

FIBRINOUS.—The X-ray findings in a case of this disorder in a woman of 45 years with severe pulmonary disturbance and expectoration of bronchial casts are described by F. H. Rodenbaugh (Amer. Jour. of Roentg., Oct., 1923). Along with an increase in bronchial tree markings there was a marked increase of density about the hilus, which still persisted 4 months later, after the bronchial markings had greatly decreased. A resemblance of the picture to some types of tumors of the lung is commented on. Somewhat similar observations were made by P. B. Mulligan and R. D. Spencer (Jour. Amer. Med. Assoc., Mar. 8, 1924) in a boy of 7 years with dyspnea, particularly at night, and expectoration of tracheobronchial casts. The X-ray showed the superior mediastinum filled with a dense shadow, blending with the heart shadow below. The cast formation in the bronchi is ascribed to mediastinal gland enlargement (secondary to infection of the air-passages higher up), with involvement of the thymus by contiguity, thus impeding the pulmonary venous circulation by compression and leading to leakage of serum into the trachea and bronchi. Two X-ray exposures of the mediastinal enlargement reduced it considerably and the expectoration of casts ceased.

SUBACUTE.—Separate consideration to a subacute form of bronchitis is given by P. Davis (Va. Med. Mthly., June, 1924). The patient is usually seen after about 3 weeks of illness, beginning with a bad cold or mild influenza. Severe cough followed, worse at night and after exposure to cold, damp air, and usu-

ally dry, slightly productive and paroxysmal. Weakness and erratic appetite are complained of, and a history of nightsweats and an occasional streak of blood in the sputum may be elicited. Physical examination is usually negative except for númerous sibilant and mucous râles over both lungs, often widely disseminated but most often confined to the bases. The pulse and temperature are generally normal. The X-ray is negative or may show some small areas of mottling. Differentiation from tuberculosis is best made by the history; the normal expansion, equal on the 2 sides; the multiplicity of râles anteriorly and posteriorly over both lungs; absence of crepitant râles after expiration and cough, and sputum and X-ray studies. Treatment consists of avoidance of night air, though fresh air and sunlight are beneficial; possibly rest in bed for 2 weeks; restriction of pastries, pork meats and tobacco; general tonics, such as the elixir of iron, quinine and strychnine, and if feasible, 6 weeks in a warm climate, such as Florida. The patient should be impressed with the fact that he does not have "consumption"—a fear usually foremost in his mind.

BRONCHOMYCOSIS.—Attention is directed by E. Steinfield (Jour. Amer. Med. Assoc., Jan. 12, 1924) to the existence in the United States of bronchomycosis of a mild, chronic type, particularly associated with certain cases of asthma and chronic bronchitis. Of 15 cases, 7 were men and 8 women, ranging in age from 25 to 60 years. All were residents of Philadelphia, and with 1 exception, gave negative histories

and tests as to sensitization to proteins. The symptoms were more or less constant cough, with relief during periods of free expectoration, and paroxysms of expiratory dyspnea, often at night, with audible wheez-During active stages sonorous sibilant râles were usually audible over both lungs. The absence of percussion changes, presence of eosinophilia (e.g., 6 or 8 per cent.), and fairly prompt disappearance of under treatment were in marked contrast to the severer lung diseases. The sputum usually showed, embedded in mucus, chalklike particles or actual islands of yeast colonies, occasionally amber-colored. The high-power objective often showed these as consisting of globular, fatlike spores; at times, during severe stages, of hyphæ and mycelia. Cultures of the particles in Sabouraud's maltose agar adjusted to pH 5.2 yielded yeasts of the genera Monilia, Cryptococcus and Endomyces.

In the treatment, potassium iodide, 2 to 4 Gm. (30 to 60 grains) a day, proved of great value. In several cases, pix liquida, 1 Gm. (15 minims) a day or more, was efficacious. Vaccines, prepared from the cultured yeasts after the method of Michel and injected in doses of 0.1 or 0.2 c.c., increased to 1 c.c., seemed to further the improvement. In all cases, the upper respiratory tract, including the sinuses and tonsils, should be examined for abnormalities or disease.

Howe and Schmidt (N. Y. State Jour. of Med., Jan. 23, 1925) report 3 cases of chronic bronchitis in which fungi were found in the sputum. **X-ray** treatment led to disappearance of the fungi and striking improvement of the bronchitis.

BRONCHOPNEUMONIA. —In a study of cases of pneumonia in infants and children received in a hospital, R. D. Moffett (Arch. of Ped., Nov., 1924) collected 199 cases of bronchopneumonia as against 218 of lobar pneumonia. In contrast to figures previously recorded, the mortality from bronchopneumonia was but 7.1 per cent., as against 12.9 per cent, for lobar pneumonia. X-ray examinations showed distinct markings in 247 cases, and are regarded as indispensable in the diagnosis of doubtful cases. In bronchopneumonia the leukocyte count was relatively low, while in lobar pneumonia it was always high.

In a study of the water metabolism in bronchopneumonia in infants, L. Ribadeau-Dumas and J. Meyer (Ann. de méd., Aug., 1924) found that usually, along with a reduction in the body-weight, the ratio of the water lost by perspiration to the total water loss rises to 60 per cent. If edema exists, however, the weight may increase and the water lost through the skin fall to 30 per cent. Variations in body-weight are due mainly to variations in perspiration, and variations in temperature are also chiefly dependent upon them. The heat lost through perspiration increases in bronchopneumonia from the normal of 40 per cent. to 75 to 90 per cent. of the total heat production, while the heat lost by radiation from the skin circulation is much reduced as compared to the normal. The prognosis is favorable according as the metabolism remains closer to the normal standards.

> P. Martini and H. Mueller (Deut. Arch. f. klin. Med., Oct., 1923) conducted experiments to ascertain in

what particular portion of the bronchial tree the vibrations audible in bronchial breathing arise. In the smaller tubes of 3 or 4 mm. diameter, overtones are so marked as to preclude consideration of these channels in this connection. Conditions in and around the largest bronchi are likewise unfavorable. The bronchi in which bronchial breathing actually arises are those of diameters ranging from 5.5 to 10 mm.

Postoperative bronchopneumonia is commonest after abdominal operations. As pointed out by Kohlmann (Fort. a. d. Geb. d. Röntgenstr., xxxii, 46, 1924), it is by no means invariably an aspiration pneumonia. As a matter of fact, thrombotic processes in vessels, resulting from inflammatory conditions, not infrequently exist previous to the operation, and when bronchopneumonia sets in 8 to 14 days after the intervention, or even earlier than this, it can usually be ascribed to embolism in the lung, with succeeding infarction. This condition nearly always develops on the right side, and occurs in individuals whose heart is unimpaired.

A case of gangrene of the legs occurring as a complication of bronchopneumonia has been reported by H. P. Harrell (Amer. Jour. Dis. of Childr., June, 1924). No similar case could be found in the literature. The patient was a negro boy of 6 years, who had been ill for a month. When he had been in the hospital 13 days, dry gangrene of the toes of both feet set in, and in a week extension of gangrene to the middle third of the legs occurred. A line of demarcation having formed, amputation of both limbs above the knee was performed, recovery following. Embolic occlusion of both popliteal arteries, at about the same level on the 2 sides, was found.

PROPHYLAXIS.—The transmissibility of bronchopneumonia is emphasized by Ribadeau-Dumas and Fouët (Méd. infant., Mar., 1924), more particularly in respect of children in hospitals and other institutions. The pneumococcus is always present in their mouths as well as in the pharyngeal secretions of bronchopneumonic cases, but is most copiously eliminated in the stools, with the result that transmission occurs chiefly through contamination of the hands. Cultural tests for droplet infection were seldom positive over 12 cm. (4\frac{4}{5} inches) from the children's mouths, and the results of air filtration tests seemed to preclude atmospheric infection. Transmission is, however, promoted by overcrowding. Isolation and asepsis should be insisted on when these cases occur in institutions. Cleanliness of the hands of the attendants is of paramount prophylactic importance. Sufficient air-space should be allowed not only for the patients but also for their themselves attendants.

TREATMENT.—The general treatment of bronchopneumonia, as applied by Moffett (loc. cit.), is similar to that employed in lobar pneumonia. The diet consists of semisolid or liquid foods. Forcing of fluids is deemed of great importance. Glass partitions are used to separate the children into groups not exceeding 2 or 3 patients, both to obviate over-crowding and to provide plenty of fresh air. Cool, but not icy cold air is used to ventilate the rooms. When the temperature rises above

103.5° F., sponge baths are given every 3 hours, together with an icebag to the head and a hot water bottle to the feet. Both digitalis and camphor are used throughout the period of high temperature. former is given in the tincture, to the amount of 1 drop for each pound of body-weight each 48 hours, reduced 1/2 when the heart has become digitalized. If prompt stimulation is indicated, ½ grain (0.03 Gm.) doses of caffeine sodio-benzoate hypodermically are used to support the patient until the action of digitalis sets in. In cases in which high temperature is combined with pronounced delirium and toxemia, whiskey is valuable when given in amounts sufficient for a full physiologic effect. For extreme toxemia, daily cleansing of the intestinal tract by rectal irrigation with sodium bicarbonate solution, coupled with mild purgation, prove helpful.

According to H. C. Berger and J. G. Montgomery (Arch. of Int. Med., Dec., 1924), the mortality of both bronchopneumonia and lobar pneumonia in children can be greatly reduced by the addition of chicken blood or serum to the usual measures. There exists in normal chicken serum a protective substance against the pneumococcus of Types I, II and III, and the chicken is tolerant to large doses of pneumococci injected intraperitoneally. The protection afforded by chicken serum is inversely proportional to the time elapsing between infection and administration of the serum. In treatment, the duration of the illness before injection, the dosage, and the age of the serum used are vital factors.

Among 41 cases treated with

chicken blood or serum the mortality was 12.2 per cent., while among 22 cases not receiving it the mortality was 36.3 per cent. Among the treated cases, the bronchopneumonia patients required an average of 2.81 days for the temperature, 1.83 for the pulse, and 2.51 for the respiration to reach normal, while in the case of those not receiving chicken blood or serum the corresponding average periods were 11, 9.6, and 10.4 days. Closely similar results were seen in the lobar pneumonia cases.

In the preparation of the serum, the chicken blood was collected in ½ gallon jars containing a known quantity of sodium citrate solution. Upon withdrawal of the serum, the citrate was removed with calcium and the serum then run through Berkefeld filters. The sterility of the serum having been proven by culture and injection into animals, trikresol was added as preservative and the serum divided among 100 c.c. rubber-capped containers.

Antipneumococcic serum by nasal or rectal instillation has been used with asserted benefit by G. Blechmann (Bull. Soc. de péd. de Paris, Feb.-Mar., 1924) in pneumococcic infections in children, including bronchopneumonia, bronchitis, nasopharyngeal catarrh, otitis, and protracted pneumococcic infection suggesting tuberculosis. These methods of administration proved as effective as subcutaneous injections, and are easily employed where such injections, or the intramuscular or intravenous routes, are impracticable. The dosage is 15 drops of serum instilled into each nostril 4 or 5 times a day, or 5 or 6 drops at hourly intervals. In grave cases the rectal instillations of 10 to 15 c.c. of serum are given in addition. Where there are intranasal foci the serum is thought to act specifically upon the bacteria locally present.

In the hands of E. Weill and A. Dufourt (C. r. Soc. de biol., Aug. 12, 1924) a polyvalent vaccine of the pneumococcus, enterococcus, staphylococcus and tetragenus organism proved of value in bronchopneumonia in infants, 36 out of 41 cases recovering under this treatment. It was particularly effective in cases of primary pneumonia, less so in the pneumonias secondary to measles, whooping-cough or diphtheria.

W. T. Freeman and L. D. Hoppe (Amer. Jour. Dis. of Childr., Sept., 1924) have found intravenous injections of mercurochrome-220 soluble of great value in the pneumonias of infants and children. The disease is sometimes shortened and often abruptly terminated. Of the cases treated, 7 had bronchopneumonia and 5 lobar pneumonia. Two patients died. In 1, death was inevitable before the drug was given. The other, with cyanosis of unknown origin previously present for several years, showed definite improvement at first but later failed to respond to treatment. In 7 cases, but 1 injection proved sufficient; 3 required 2 injections, and 2, 3 injections. The average dose was 0.005 Gm. per kilogram of body-weight, given in a 1 per cent. solution. In the preparation of this solution, the drug is simply dissolved in distilled water and the solution filtered. It is selfsterilizing and should not be heated.

Usually the systemic reaction is mild. In a few hours after injection there is often a rise of 1 or 2 degrees

in temperature. The urine is often colored pale pink by the drug, and sometimes the feces are colored red. The very marked clinical improvement usually seen a few hours after the injection sometimes occurs without any marked change in temperature or pulse rate.

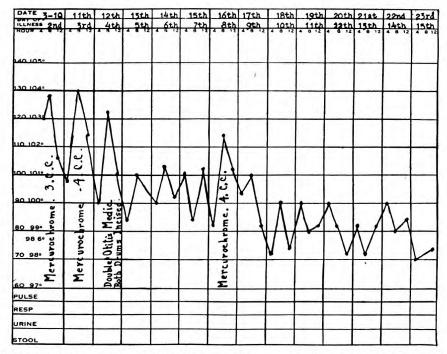
In a case of bronchopneumonia in a child of 5½ years, severe, foul diarrhea had developed in the 4th week, and on the 38th day she was in a desperate condition, with 5 areas of lung consolidation, ears discharging profusely, many skin abscesses, and cyanosis. Mercurochrome being given, the temperature fell as if by crisis, and she began a rapid and uninterrupted recovery.

From 2 to 4 hours after the injection a rapid fall in temperature usually occurs; occasionally, when not so abrupt, the fall resembles a very sudden lysis. The most striking effects, however, are seen in the patient's general appearance; in a few hours the child appears comfortable and quiet, as after the crisis in pneumonia.

Experiments showed that in a dilution even greater than that existing in the blood when the drug is given intravenously in the dose referred to, it will kill the *Streptococcus* hemolyticus in defibrinated blood in 1 hour. After intravenous injection of mercurochrome in animals, the tissue fluids squeezed from the lungs are inhibitory to the growth of bacteria.

According to R. S. Rowland (Jour. Mich. State Med. Soc., Jan., 1925), the mortality in pneumonia should be reduced to a low rate by proper oxygen therapy and medicinal heart support. It has been shown that

there is a varying degree of anoxemia almost from the start, which oxygen relieves at once. Early administration of oxygen is important because the effect of oxygen deficiency on the nerve centers and tissues develops insidiously, and once started, the damage leads to progressive deterioration of the vital funcpneumonia and other serious lung disturbances of children, as well as in whooping-cough. Pure ether hypodermically is similarly beneficial, but the resulting pain and other possible untoward local effects render the administration in oxygen more desirable, the oxygen itself, moreover, acting favorably. The oxygen



Intravenous mercurochrome injections in a case of bronchopneumonia in a girl aged 11 months. (Freeman and Hoppe, in Amer. Jour. Dis. of Childr.)

tions. For the same reasons, the oxygen should be continued until all signs of deficient oxidation are past. Small doses of digitalis from the outset are advantageous. For collapse with small thready pulse, adrenalin, given slowly, is useful, with atropine sulphate as respiratory stimulant.

Subcutaneous injections of ether vapor in a menstruum of oxygen gas are favored by J. Jarricot (Ped. españ., Oct. 31, 1924) in broncho-

is passed through a tube containing ether, which is vaporized and carried along by the oxygen to the extent of 2 c.c. of ether per 100 c.c. of oxygen. Gentle application of heat with the hand or warm water hastens the vaporization. The dose of ether is 2 c.c. in children of 1 to 2 years and 1 c.c. or less in those below 1 year. In acute lung disorders, an injection is given daily at first, then on alternate days, and finally the ether is dispensed with and oxygen used alone.

J. M. Anders (Jour. Amer. Med. Assoc., July 26, 1924) deems hydrotherapy useful in some cases, at least, especially in children. A sponge bath at 90° F., later reduced to 80° F., followed by gentle toweling of the surface, so as to secure full reaction, often exerts a happy effect. A high temperature calls for a cold pack, a sheet doubled and wrung out of water at 80° F. being wrapped evenly about the patient and allowed to remain for ½ to 1 hour.

According to G. L. Waldbott (Med. Jour. and Rec., Dec. 3, 1924), for restlessness pantopon is the most effectual opiate, its content of narcotine especially reducing its depressing action on the medulla. In extreme delirium, however, where unduly large doses of opiates would be required, hyoscine is preferable. In a case of bronchopneumonia with violent delirium, restlessness continuing even after 1/3 grain (0.02 Gm.) of pantopon, so that 5 nurses were required to hold the woman in bed, an injection of hyoscine brought complete relaxation.

In a case reported by L. Bernard (Bull. Soc. méd. des hôp. de Paris, Dec. 6, 1923), there developed early in measles a condition regarded as either bronchopneumonia or tuberculosis, which subsequent observation showed to have been the former. The child being in a very serious condition, artificial pneumothorax was instituted, a series of 5 insufflations being given. After the 2d, the temperature dropped, and soon remained permanently normal, complete recovery following within 2 weeks. The treatment had thus radically changed the patient's condition for the better in a few days. The availability of such treatment is furthered by the fact that the compressed lung can be permitted to reexpand as soon as recovery from the acute pulmonary disorder has occurred.

BRONCHOSCOPY. —With a combined experience of over 5000 bronchoscopies without a single death due to the introduction of the instrument, C. Jackson, G. Tucker, L. H. Clerf, R. M. Lukens and T. F. Moore (Jour. Amer. Med. Assoc., Jan. 10, 1925) regard bronchoscopy for the diagnosis of disease as a harmless procedure, indicated in practically every case of suppurative lung disease in which the advisability of thoracotomy is being considered. By bronchoscopy the surgeon may learn precisely not only the particular lobe involved but also the particular part of the lobe. Accurate localization by pneumonography (bronchoscopic powdered bismuth subcarbonate insufflation followed by roentgenography) is afforded, as well as the practical certainty of biopsy.

Tonsillectomy as a cause of lung suppuration has assumed enormous importance. The infection may occur not only by aspiration, but also through the lymphatics or bloodvessels. The 3 lines of natural pulmonary defence are held by the cough reflex, ciliary activity, and the germicidal action of the lung. Granulations have no cilia, and scars, Cough will make up for absence of cilia, but only after some stagnation of secretions and local irritation, creating a vicious circle. Here bronchoscopic aspiration will come to the rescue, as shown by many cases of disappearance of foul odor from the sputum after a few weeks' treatment. Defective ciliary action has been shown to be a prime factor in asthma. Early bronchoscopic aspiration cures the posttonsillectomy lung suppuration, sometimes in an almost magic way. Well-developed pulmonary abscesses are also relatively rapidly cured. In abscess with surrounding suppuration, bronchoscopic aspiration of the periabscessal suppurative zone is fully as important as the aspiration of the abscess itself.

Cicatricial and other forms of bronchial obstruction due to inflammation are both preventable and relievable by bronchoscopic drainage in certain cases. Strictures can be dilated and granulations and granulomas removed de visu. Retrograde bronchoscopy through the chest wall has certain uses in the exploration and treatment of fistulas communicating with bronchi and suppurating foci.

Benign growths in the bronchial lumen as a cause of suppuration can be diagnosticated only with the bronchoscope, and their bronchoscopic removal causes prompt subsidence of the suppuration. In malignant disease of the lung, an absolutely certain diagnosis can usually be made at such an early stage of the malignant process that there is a chance to cure the patient by lobectomy. Malignant infiltration produces a very characteristic deformity and fixity-a "wooden" appearance—on bronchoscopic inspection. In endobronchial cases there is either a mass, nodule, fungation or ulcer, most often a nodule, with visible bleeding at a relatively early stage.

In most cases of lung suppuration in which external operation is inadvisable, peroral bronchoscopic aspiration should be done weekly or oftener.

## BRONCHOSPIROCHETOSIS.

—According to A. E. Greer (South. Med. Jour., July, 1924), Castellani's spirochetosis bronchialis is prevalent in the Southern States. In the acute form, lasting 7 to 21 days, there are cough, mucopurulent expectoration, fever, and slight chest symptoms and signs. After 1 or more acute attacks, or independently of such attacks, in an insidious manner, the chronic form may develop, with mucopurulent, bloody, often foul sputum, but often no marked deterioration of general health. Intermediate, subacute types also occur.

DIAGNOSIS.—The diagnosis is based on the finding of S. bronchialis in the sputum, while tuberculosis, endemic hemoptysis and bronchomycosis are excluded by the absence of tubercle bacilli, Paragonimus westermani, and fungi. As noted by L. S. Huizenga (Ned. Tijd. v. Gen., Dec. 22, 1923), S. bronchialis, 5 to 30 microns long and exhibiting 4 to 8 spiral turns, is frequently visible in fresh sputum specimens, but may with advantage be fixed by heat and stained with gentian-violet. germ may invade the bronchi because of impaired resistance from anemia or other sources of lowered vitality, or may follow acute colds or bronchitis. In the acute cases there may occur, aside from the cough and fever, chills, pain in the chest and nightsweats, with foamy and sometimes bloody sputum. In the chronic cases actual hemoptysis may occur.

According to Y. Schwarz (Lancet, Dec. 27, 1924), who reports 6 cases from Cairo, Egypt, there is a tendency to group together the various parasitic spirochetes of the mouth, teeth, pharynx and bronchi and to consider them, if not a single species, at least as capable in such localities of provoking identical lesions and symptoms. The fact that all his cases presented pyorrhea alveolaris is regarded by him as supporting this view. Doubt is even thrown on the separate identity of the fusiform bacilli and the spirochetes of Vincent. Films from his 2d case gave results identical with those obtained in the most typical cases of Vincent's angina, in spite of the absence of symptoms of the latter. These films also showed forms intermediate between the fusiform bacillus and spirochete of Vincent, suggesting that the bacillus is merely an encysted form of the spirochete. The writer concludes that the fuso-spirillar organisms of Vincent may-seemingly after pyorrhea as their first localizationestablish themselves in the bronchi and provoke a bronchitis of the Castellani type. His cases were all chronic from the first and apparently not contagious.

TREATMENT.—Neoarsphenamin gives definite results in this disease, according to the majority of authors. Of the cases seen by Schwarz (loc. cit.) all were cured by 1 or 2 intravenous injections, except 1 case of 8 years' duration, in which 8 weekly injections of 0.15, 0.2, 0.3, 0.45, 0.45, 0.6, 0.6 and 0.6 Gm. were given, and temperature reduction and recovery began only after the 7th injection. He quotes N. Farah, however, as not having been satisfied with the results from neoarsphenamin and as employing only iodine in the form of lipiodol in intramuscular injections of 2 c.c. daily then spaced, always with very good, though somewhat slow, results.

Huizenga (loc. cit.), in China, gives 4 drops of Fowler's solution 3 times daily, reserving the more expensive neoarsphenamin, in particular, for cases complicated with recurrent fever. For the 1st week in the acute cases the patient should remain in bed. When the sputum is bloody, calcium lactate, 0.3 Gm. (5 grains), is given 3 times daily. Acetylsalicylic acid may be given for pain and the cough controlled with various cough mixtures.

According to J. R. Risquez (Gac. méd. de Caracas, July and Aug. 15, 1923), who discovered 76 cases of bronchospirochetosis in tuberculosis sanatoriums and elsewhere in Caracas, Venezuela, the disease seems to be transmissible, and antimony intravenously is the most effective treatment, though arsenic by mouth also proves beneficial. In a case referred to by Cassaët, Bonnin and Guénard (Gaz. hebd. des sci. méd. de Bordeaux, Apr. 13, 1924), arsenicals, antimony, iodides and balsams all failed, and direct local treatment was deemed advisable. These writers. like Schwarz, found a fusiform bacillus in conjunction with the spirochetes in the sputum.

BUERGER'S DISEASE (THROMBOANGIITIS OBLIT-ERANS).—ETIOLOGY.—The multiplicity of theories suggested as to the origin of this disease indicate, according to B. Jablons (Med. Jour. and Rec., Sept. 17, 1924), that one is dealing with a group of symptoms due to a variety of causes, and that while the pathology may vary but slightly, the causes may be quite different. Study of the histories of a large number of cases impresses one

with the idea that in the majority of cases some preëxisting injury to the blood-vessels has occurred, either as a result of frost-bite or some trauma followed by infection and consequent arteritis and phlebitis. Buerger believes on the basis of his microscopic findings that some bacterial agent is responsible. The leukocytes seem to be affected by the causal agent, the average count in 50 or more cases having been about 11,000; the lymphocytes exceeded their normal count by about 10 per cent. In most cases a definite eosinophilia was present. Many patients show a markedly accelerated coagulation time, which apparently explains the tendency to thrombosis of the affected blood-vessels-an important element in the production of many of the symptoms.

From a study of 27 cases of endarteritis obliterans, J. Heitz (Ann. de méd., Nov., 1923) concludes that diabetes, syphilis and excessive use of tobacco are outstanding etiologic factors. An excess of cholesterin in the blood was observed, the average being 2.77 Gm. per liter; a rather uniform relationship seemed to exist between the cholesterin and the extent, degree and age of the arterial lesions. Twenty-three cases had intermittent claudication, and 2 were Hebrews corresponding to the condition described by Buerger.

According to W. G. Stern (Jour. of Bone and Joint Surg., Oct., 1924), angiotrophosis, which includes Buerger's disease, is the only disorder with normal erythrocyte count in which high blood viscosity is not unusual. Viscosities of 4.8 or over were found in 85 per cent. of all cases. In conjunction with the presence of painful

papules and the clinical picture of trench foot, evidence is afforded of a group of conditions more or less related, and which the writer finds usually amenable to treatment.

PATHOLOGY.—The pathology of this disease was studied by E. D. Telford and J. S. B. Stopford (Brit. Med. Jour., Dec. 6, 1924) in the specimens from 3 cases subjected to amputation. Most or all of the popliteal artery was found occluded. The lumen was filled with loose fibrous tissue containing a number of minute channels, all with an endothelial lining and some with a thin muscular tunic. The intima was slightly thickened, while the media showed a marked reduction of muscular tissue and the adventitia was greatly thickened, contraction of it having reduced the diameter of the vessel. The popliteal vein was also observed to be thickened thrombosed.

TREATMENT.—The treatment advised by Stern (loc. cit.) in acute cases consists of rest in bed, a bland diet, continuous electric light baths to the extremities, introduction of 4000 to 6000 c.c. of Ringer's solution through the duodenal tube, and sodium iodide intravenously. Upon subsidence of the acute symptoms, there should be a complete change in the habits of the patient in order to reduce functional demands on the local circulation, with avoidance of all forms of toxic absorption, ingestion of large quantities of water, and the circulation exercises devised by Buerger. At all times the body should be protected from being chilled or compressed.

Simonema (Siglo méd., Apr. 26, 1924) reports 3 out of 4 cases greatly

benefited by the use of sodium citrate and iodides. Benzyl benzoate seemed of value in relaxing the affected vessels. Stovaine or zinc oxide ointment was used for the relief of local pain.

A case in a man of 45 years reported by J. Troisier and A. Ravina (Bull. Soc. méd. des hôp. de Paris, May 15, 1924) was peculiar in that the patient was not a Hebrew and that involvement of 1 of the brain arteries, producing partial hemianopsia, was superadded. Otherwise the usual manifestations of Buerger's disease were present, including severe nocturnal pain in 1 limb, hyperemia of the affected limb in the standing posture and pallor when horizontal, loss of pulsations even after a hot bath, intermittent claudication, and increase of the red cells, of blood-coagulability, and of blood cholesterin, the latter finding suggesting increased adrenal activity and a resulting disturbance of lipoid metabolism. Gradual moist gangrene of % of the foot was successfully met by giving sodium citrate intravenously (28 injections) and the use of hot air and dressings of ether. Arrest of the gangrene, with subsequent sloughing, and cessation of pain soon resulted, and after 9 months the patient was entirely well. A course of neoarsphenamin injections had also been given on account of an earlier slightly positive Wassermann reaction. In the use of sodium citrate in such cases, the writers advise at the start daily injections of 6 or 4 Gm. (11/2 or 1 dram) of sodium citrate in a 30 per cent. solution. Later, when improvement has resulted, the intervals between injections may be lengthened to 2 or 3 days, or, the citrate may be administered by hypodermic injection or by the mouth.

**BULBAR PARALYSIS.**—Two cases of bulbar paralysis due to thrombosis of the basilar artery are reported by S. Koster (Ned. Tijd. v.

Gen., Apr. 12, 1924). In 1 case syphilis was of 2 and in the other of 6 years' standing; in both, active and protracted antisyphilitic treatment had been given. In the 1st case, the probability of an endarteritis with thrombosis rather than embolism was supported by the lack of any apparent cause for the latter and the slow onset and low blood-pressure. When paralysis of all 4 limbs had existed for 10 weeks, the writer administered 0.9 Gm. of neoarsphenamin in 2 weeks and followed this with mercury and bismuth. After the 1st arsenical injection the patient's speech improved, and he soon entirely recovered. The 2d case died, and the diagnosis of basilar thrombosis was confirmed at autopsy.

BURNS. —SYSTEMIC FECTS.—Among the chief factors stated to cause death after burns are shock and toxemia. From experimental work, B. Robertson and G. L. Boyd (Jour. of Lab. and Clin. Med., Oct., 1923) conclude that when death from burning occurs in the first 24 hours it is practically always due to primary shock; when later, to toxic shock. In all animals dying within a week, general hyperemia and parenchymatous changes in the abdominal organs were found, frequently with ecchymoses and ulceration of the intestinal mucosa, and in 1 instance, perforation of the ileum. In burnt tissue, particularly in skin burns, a toxin is formed which circulates in the blood, within the red corpuscles, and is the cause of the symptoms and sometimes of death, Whereas extracts of skin burnt during life are toxic, those of skin burnt after death are innocuous. Doses of 2 or 3 c.c. of whole blood from children or rabbits with burn toxemia, injected into guinea-pigs, caused alternate drowsiness and excitability, weakness of the hind legs, convulsions and sometimes death, with autopsy findings like those in fatally burned animals. On the other hand, injections merely of the serum from the children or rabbits caused no symptoms. Solutions of the corpuscles properly treated were more toxic than whole blood.

The toxin was found to be soluble in water or saline solution, slightly soluble in alcohol, nonvolatile, and not destroyed, though modified, in activity by boiling. Apparently it consists, like snake venom, of 2 parts, the one thermostabile, diffusable and neurotoxic, and the other thermolabile, non-diffusable and necrotoxic. Salting out procedures pointed to its consisting chemically of primary and secondary proteoses.

In experiments on guinea-pigs, subjected to burns of the abdominal surface, R. Brancati (Policlin., May, 1924) observed uniformly, after a latent period, a condition of flaccid paralysis, tonic and clonic movements of the limbs, twitching of the skin muscles, opisthotonos, Cheyne-Stokes breathing, hypothermia, and free discharge of feces and urine. Microscopic study of the nervous system showed scattered areas of hyperemia of the brain, with hemorrhages into the cortex, base, ependymal canal, medulla and spinal cord. Areas of disintegration were found at various points upon repeated injection of fresh extracts of the liver of burned guinea-pigs. The writer emphasizes a marked similarity between the symptoms and pathologic changes in burns and those of anaphylaxis, and ascribes death in burn cases to anaphylactic shock from the proteins changed by heat at the burned area and absorbed therefrom.

In a case recorded by E. Novak (Amer. Jour. Med. Sci., Jan., 1925), in which death occurred on the 10th day after the burn, multiple small ulcers were found in the stomach near the pylorus. No gastrointestinal symptoms except vomiting had existed.

J. Olbrycht (Rev. de méd., xli, 81, 1924) asserts that early death in burn cases may result from a combination in varying proportion of several factors, viz., nervous shock, changes in the red blood cells, thermic hemolysis and reduction of blood plasma. In late death the cause is poisoning by the toxic substances resulting from the decomposition of proteins in the burned area by proteolytic ferments under the influence of heat. These substances, according to his studies in severely burned men and animals, react very particularly on the suprarenals, which show hyperemia and localized hemorrhage, especially in the medulla, and reduction or complete loss of chromaffine substance and lipoids; these changes appeared to vary in accordance with the extent of the burn and the youth of the patient. The sequence of events is believed to consist of increased adrenal activity at first, followed by exhaustion of the chromaffine system and death. The changes in the adrenals are similar to those found in anaphylactic shock and in peptone intoxication. The treatment should, on this basis, include the removal of burned tissues, to avoid the resulting toxic effects, together with injection of saline solution to dilute and eliminate those toxins which may nevertheless enter the system, and stimulation of the suprarenal function or administration of adrenalin to make up for the lack thereof.

TREATMENT.-In GENERAL extensive superficial burns there occurs an outpouring of fluid over the surface of the injured area; or, an increasing edema of the part may result. According to F. P. Underhill, G. L. Carrington, R. Kapsinow and G. T. Pack (Arch. of Int. Med., July, 1923), the resulting rapid increase of concentration of the blood plays an important part in the symptoms, outcome and treatment of the case. Life is endangered when the blood concentration exceeds 125 per cent. of the normal for any length of time. Determinations of the hemoglobin content of the blood in 21 victims of a theater fire showed a rise in blood concentration varying with the severity of the burn. The treatment applied in these cases consisted of rapid, continued introduction fluids by the mouth, rectum, under the skin or intravenously, according to indications. The resulting gradual, pronounced drop in blood concentration and diuresis was attended with marked clinical improvement and disappearance of such manifestations as delirium, coma, hemoglobinuria, gastrointestinal disturbances, etc. Regular heart action and circulation is favored by the procedure, and the toxicity of the poisons present is reduced by dilution and elimination. The amount of fluid given daily was 4 to 8 liters (quarts). Small quantities of sodium bicarbonate were also given.

In dealing with the toxemia from burns, B. Robertson and G. Boyd (Amer. Jour. Dis. of Childr., Feb., 1923) advocate a procedure which they term exsanguination-transfusion. Following a period of general good condition lasting 24 to 48 hours, the temperature may rise, the patient become drowsy, the pulse more rapid, and the circulation depressed. These manifestations may subside about the 5th day, but in the more severe cases the temperature may reach 106° F., with persistent vomiting, soft pulse, dusky or livid color, and sometimes muscular twitchings and convulsions, which may be fatal. In treatment the object is to withdraw much more blood than could be done by venesection and replace it with fresh adult blood. The amounts withdrawn in 10 cases ranged from 200 c.c. in an infant to 500 c.c. in a child of 3 years. The blood was taken from the longitudinal sinus or femoral vein to the limit of safety, when transfusion was begun into a vein at the elbow. When the blood withdrawn reached an slightly less than the amount available for transfusion, withdrawal was discontinued and the remainder of the available blood injected. The results were considered encouraging, 7 out of 10 patients with convulsions recovering under the treatment, whereas previously no recoveries had occurred after a convulsion due to burn toxemia.

I. S. Ravdin and L. K. Ferguson (Ann. of Surg., Feb., 1925) found the hemoglobin above 100 per cent. (up to 140 per cent. in 1 instance) in all but 2 of 15 hospital cases of burns. In toxemia they regard exsanguination-transfusion as affording consid-

erable hope of success, but in their adult cases did not attempt to exsanguinate the patient completely, while in the child the amount withdrawn was about 20 c.c. per pound of body-weight. The blood was generally removed from the median basilic vein and transfused into the saphenous. Where signs of circulatory collapse appeared early, normal saline solution was given in the course of the exsanguination. The diet in burn cases should be light, but reinforced, chiefly with carbohydrates, to supply calories in an easily assimilable form and afford glycogen to the system.

In 11 cases of burn resulting from the explosion of a gas tank, the initial systemic measures used by J. F. X. Jones and A. P. Keegan (Med. Jour. and Rec., Jan. 16, 1924) consisted of the injection of 1/4 grain (0.015 Gm.) of morphine and 1500 units of tetanus antitoxin. The urine was examined at once and every 24 hours thereafter for albumin, casts, diacetic acid and acetone. Internally, the patients received coffee, potassium citrate, calomel, magnesium citrate, and abundance of water and concentrated liquid food. Three patients were placed in the electric cabinet because of subnormal temperature, and also received atropine hypodermically and whiskey. In 1 case in which acidosis was suspected (but did not eventuate), sodium bicarbonate by mouth and bowel was ordered without waiting for the result of the uranalysis.

LOCAL TREATMENT.—According to W. E. Lee (Therap. Gaz., Dec., 1923), the same principles of treatment should be applied in burns as in other types of traumatic

wounds. He classifies burn cases into non-infected, contaminated, infected and suppurating. Non-infected burns include those of the 1st and 2d degrees in which the blisters are unbroken; primary closure by a paraffin film and prevention of secondary infection are the local measures indicated. Contaminated burns are those treated within 3 hours and in which it is possible entirely to remove dead or devitalized tissue by mechanical means; primary closure by a paraffin film is attempted provided microscopic examination of the exudate shows absence of streptococci. Burns of the 3d degree are classified as infected from the 12th to the 24th hour and as suppurating after 72 hours.

During the period of shock, Lee applies weak antiseptic oils to the necrotic tissues. Then, after 24 hours, all loose and detached tissues are removed with scissors, and by way of chemical débridement, the burned part is immersed for 1 hour daily in 2 per cent. sodium bicarbonate solution. In such cases ointments and paraffin shells are condemned; instead, the surfaces are exposed to heated air the rest of the 24 hours. In involvement of the trunk or denudation of large areas of the extremities, body heat is conserved by covering the patient with a blanket tent over the bed, under which a temperature of 98 to 100° F. is maintained with electric lights. Dakin's solution is efficient in chemical débridement, but few patients can endure the resulting pain, and usually the natural autolysis and daily bicarbonate immersions suffice.

Until surgical sterility of the burn is obtained, Lee provides the neces-

sary drainage by merely covering the surface with a single layer of widemesh paraffin gauze. Fly-netting of  $\frac{1}{32}$  inch mesh is cut into  $4 \times 6$  in. pieces, placed in a muslin wrapper and sterilized, dipped into paraffin wax kept at 45° C. over a waterbath, drained, cooled for a few moments, and packed in muslin wrappers. To obtain and maintain sterility of the burned surfaces thus exposed to the air, Lee uses weak solutions of dichloramine-T, carefully tested for absence of free Cl or HCl. At first, only a 0.025 per cent. solution is used; as the patient becomes accustomed, the strength may be gradually increased to 0.5 per cent.

In shocked burn cases, Raydin and Ferguson (loc. cit.) have the clothing removed as soon as possible and an electric cabinet placed over the bed to maintain an air temperature of 100° F. The burned area is promptly covered with gauze saturated with 0.5 per cent. procaine solution, to each ounce (30 c.c.) of which 10 minims (0.6 c.c.) of 1:1000 adrenalin solution have been added. Upon recovery from the shock, a 2d degree burn is thus sufficiently anesthetized to permit of removal of the burned skin and opening and uncovering of the blebs. In 3d degree burns, anesthesia by nitrous oxideoxygen is induced in adults, or by ether in very young children, within 24 hours and careful débridement performed. The procaine dressing is maintained for 2 to 4 days, according to the size of the burn and the time of débridement. A fresh 2 per cent. solution of dichloramine-T is then sprayed over the area every 3 hours. Daily bathing is called for remove the resulting crusts.

smaller burns dressings of normal salt solution suffice. Under this treatment all but 1 of 15 cases recovered and the average hospital stay was 31.8 days. In cases with extensive denudation Thiersch or whole thickness skin grafts are applied as soon as healthy granulations appear.

The advantages of the local application of vasoconstrictor drugs to check absorption of poisonous substances has been emphasized by Beverly Douglas (Jour. Amer. Med. Assoc., Dec. 8, 1923) on the basis of animal experiments. Superficial burns, quickly opening up enormous capillary beds to injurious substances, constitute an urgent indication for such treatment. Experimental and clinical results indicate that epinephrin applied locally will largely, if not completely, prevent its own absorption through direct action on the first vessels not severely injured. Procaine, because of its synergy with epinephrin, seems to make this gross effect more complete and lasting. Epinephrin locally seems non-irritating, even when applied for long periods to wound surfaces. Restriction of the exchange and flow in the capillaries by epinephrin and procaine prevents absorption of harmful agents and allays the extensive pouring out of blood elements into the tissues and the attendant signs of inflammation.

In 1st degree burns E. L. Goss (Jour.-Lancet., Oct. 15, 1924) uses, for the relief of pain, a mixture of 1 teaspoonful of lead subacetate solution in a pint of cold water, or a 1 per cent. solution of aluminum acetate, applied on gauze or lint. Thereafter an aseptic dusting powder of zinc oxide, zinc stearate or talc may be used. To reduce the erythema, 2 to 5 per cent. mixtures of ichthyol with water are useful. After removal of the bandages a calamine cream may be applied:

R. Calaminæ præp.,
 Zinci oxidi, .....āā 3j (4 Gm.);
 Ol. amygd. expr. ... f5j (4 c.c.);
 Liq. calcis ....... f3j (30 c.c.).—M.

In 2d degree burns, shock is to be relieved; foreign matter removed from the burn, saline solution or boric acid solution being used for irrigation; bullæ punctured and evacuated antiseptically unless infection is feared, and a dressing of 1 per cent. picric acid or aluminum acetate solution applied.

In 3d degree burns, Goss counsels the cutting away of all dead tissue; irrigation with Dakin's solution or with saline or boric solution, and dressing as in 2d degree burns. When the eschar separates—usually in about 14 days—the area is irrigated, dead tissue removed, and the surface dried in the open air or with an electric dryer, and healing then allowed to take place either under a natural scab, in which event a mild astringent powder is dusted on repeatedly as serum accumulates, or by the well-known paraffin method of alternate paraffin spraying and cotton flannel layers, the mixture used consisting of resublimed betanaphthol, 0.25 per cent.; oil of eucalyptus, 2 per cent.; olive oil, 5 per cent.; soft paraffin, 25 per cent., and hard paraffin, 67.75 per cent.

In the cases cared for by Jones and Keegan (loc. cit.), sterile gauze dressings saturated with hot 10 per cent. sodium bicarbonate solution were used for the first 72 hours, after which the burned area was kept moist with 2 per cent. Dakin's oil. This preparation might be irritating for some patients, but the writers' 11 cases in laborers did not seem to suffer any pain from it. The writers

agree with Moorhead's definition of burns as "infected wounds due to heat," and believe with Lee that sealing burns with wax is comparable to closing traumatic wounds.

According to P. Ganguli (Indian Med. Gaz., Sept., 1922), picric acid is particularly useful in the 1st stage of burns and scalds on account of its anesthetic property, but when the pain has passed off and a raw, sometimes inflamed surface has to be dealt with, flavine is valuable, taking part in the production of a yellow fibrinous layer under which granulation rapidly sets in and which soon peels off, healthy granulation tissue remaining. The flavine should then be replaced by other antiseptics.

ELECTRIC BURNS.—In this type of injury, as stated by O. J. Fay (Jour. Iowa State Med. Soc., June, 1923), the victim's contact with the source of current should be immediately broken with the aid of rubber gloves or even a dry cloth or dry board. The patient should then, without any delay, be laid on his back with his head raised on a pillow, his chest bared, and artificial respiration and attempts to restore heart action begun at once. Stimulants should not be given by mouth until natural breathing is resumed. A cold enema, alternate hot and cold affusions to the chest, subcutaneous or intravenous injection of camphorated oil or adrenalin, venesection, chloroform inhalations, or spinal puncture may be of benefit. local treatment is like that of other burns. The greatest damage is done to the nerves and vessels, gangrene sometimes following. In this event, a definite line of demarcation should be awaited previous to amputation.

## DEFORMITY FOLLOWING BURNS.

—A. Schwartz (Paris méd., Aug. 30, 1924) emphasizes the need of sufficiently early active and passive movements of burned members, e.g., the fingers, to obviate stiffness of the joints from prolonged immobility in a rigid dressing.

Discussing the restoration of the burnt child, V. P. Blair (South. Med. Jour., July, 1923) states that spontaneous epithelization of the wound is not necessary before skin grafting or flap operations are begun. In dealing with a scar, the latter must be cut sufficiently to allow the remaining skin and tissue to return to their normal positions. To cover the resulting raw surface, the Thiersch graft, while the most easily applied, gives the poorest cosmetic results and in healing contracts more than the others. In a clean field, where slight tanning is not objectionable, the full-thickness skin graft, which contracts only about 1/3 to ½ its area, is the graft of choice. The flap graft is thicker than the preceding, carries some subcutaneous tissue, does not tan abnormally, and may be placed in a field not absolutely clean.

The full-thickness graft is taken from skin most closely resembling that about the area to be covered and is cut exactly the size of the space for which it is intended. In 24 hours it has an active bloodsupply. To prevent harmful engorgement the writer uses a fine marine sponge wrung out as dry as possible and applied over xeroform ointment gauze under the right amount of bandage pressure. This is removed for inspection after 1, 2 or 3 weeks. In the 2d or 3d week, if vesicles appear, the desquamated surface is painted daily with 1 per cent. silver nitrate solution. In children the full-thickness graft takes best and gives the best results. Flaps are obtained from neighboring parts or transferred as "jump" flaps on the hand or

In ectropion of the eyelids or lips, Blair finds the Gillies outlay graft—a Thiersch graft applied over a wax form—to be usually the best. Destroyed eyebrows can be well imitated by a full-thickness graft from the scalp behind the ear. Burned ears are unfolded and the defect covered with flaps or full-thickness grafts. Simple thickening of a scar may be dealt with by

shaving off the ridges and edges and applying a Thiersch graft, by the use of radium, by excision followed by a full-thickness graft, or by a sliding flap or a pedicle flap.

A Z-plastic method of correcting burn scar deformities is described by S. L. McCurdy (Jour. of Bone and Joint Surg., July, 1924). Two flaps are first made by splitting the scar from 1 end to the other at its crest, and are dissected loose deeply, even down to the muscle-fascia, if possible. Two other incisions, forming a Z with the 1st, are next made from its 2 ends, running into normal tissue where possible. The resulting 2 flaps having been dissected loose, the joint or neck is extended, and the flaps made to cross each other and fit into the opposite denuded surfaces. The burn scar is thus transferred to the ends of the field of operation, and normal skin brought to the center of the wound. The points of the flaps are finally sutured in their new positions, and the skin lines likewise if they can be approximated.

## BURSITIS.—PATELLAR.—In a case reported by E. Petersen (Ugeskr. f. Laeg., Aug. 16, 1923), suppuration occurred in the bursa in front of the patella of a young woman. The gonococcal nature of the process was bacteriologically proven, and recovery soon followed incision of the bursa and treatment of the urethra and vagina.

SUBACROMIAL AND SUB-DELTOID.—From observations in over 200 cases, H. F. Wolf (Amer. Jour. of Surg., Mar., 1923) states that there is a fulminating form of these types of bursitis, in which the disease reaches its height in a few hours, and another acute form lasting for weeks. Pain is severe, and the arm is generally pressed against the body. The great tenderness in the region of the bursa often extends into the surrounding tissues, though there are no signs of skin inflammation. In 10 per cent, of cases the writer hoted disturbances in other parts, particularly a swelling of portions or all of the arm of the same side. Brachial neuritis may precede, accompany or follow an attack of subacromial bursitis, from which it is distinguished, when present alone, by the fact that motion of the arm is free, however severe the pain. Tuberculosis of the joint is characterized by slow development and mildness of the pain, while in tenosynovitis there is no pain when the arm is at rest or is moved passively.

In the treatment, the writer commends very gentle massage with the whole hand, wet dressings, and the use of acetylsalicylic acid. In very severe cases a light icebag or ice compress is indicated. Acetylsalicylic acid, when used, should be given in large doses. The massage should be given once or twice a day, for 20 to 30 minutes. No motions should be made until the pain subsides. Heat in all its forms is contraindicated, aggravating the inflammatory process. Removal of foci of infection, generally the teeth or tonsils, is advisable, as the condition is due to an infection by Streptococcus viridans. Only teeth with distinct abscesses should be extracted; relief in 4 or 5 hours may result. In all but 3 of the writer's cases a cure was obtained within 10 days, and often in 3 or 4 days. In the 3 uncured cases no foci could be found and treatment was cut short by the patients.

A sudden appearance and disappearance of X-ray shadows ascribed to calcium deposits in subdeltoid bursitis is commented on by W. G. Stern (Surg., Gyn. and Obst., Jan., 1925). He reports 3 cases with all the usual symptoms, viz., freedom of the sawing

motions in the shoulder joints, inability to abduct and rotate the arm, tenderness, pain radiating down the arm, inability to place the hand back of the head or buttock, etc., in which, diathermy failing to give lasting relief, operation was carried out, revealing a small, oblong, encapsulated, soft but firm, non-fluctuating tumor, in or upon the supraspinatus tendon at its insertion in the greater tuberosity. The contents were granular, noncrystalline, non-oily, non-fluid, brownish gray in color, and absolutely not hard or bony when scraped with a knife blade. Nowhere was a bony or calcium deposit to be found. That the shadow-casting deposit was actually removed was indicated by the X-ray examination.

The laboratory reported the substance found as amorphous fat. Apparently such metamorphosed fat deposits account for the vagaries in the X-ray shadows.

According to L. Bérard and C. Dunet (Rev. de chir., lxi, 194, 1923), less than 30 cases of tuberculous hygroma of the subdeltoid bursa are so far on record. The condition is attended with atrophy of the deltoid muscle. Sinus formation is rare. Tuberculous bursæ sometimes contain rice bodies, and may contain pinkish fungous outgrowths projecting into clear, gelatinous fluid. In the case reported by the writers, a woman of 39 years had a swelling of the size of a large orange on the anterior aspect of the shoulder, with the skin movable over it but showing dilated veins. Shoulder mobility was normal, though attended with pain. The X-ray was used in diagnosis, revealing no bony changes. The treatment consisted of evacuation of 1 pint of clear fluid by puncture, careful separation of the deltoid fibers, and excision of the cyst wall, recovery following.

BUTYN.—This local anesthetic has been credited, from the standpoint of ophthalmologic use, with the following properties: More powerful than cocaine, a similar quantity being required; more rapid action; action more prolonged; less toxic; no drying effect; no change in the size of the pupil; no ischemic effect and consequently no shrinkage of tissue; no impairment of anesthetic efficiency on boiling.

According to animal experiments and clinical tests by H. L. Schmitz and A. S. Loevenhart (Jour. of Pharm. and Exp. Ther., Sept., 1924), butyn probably has no advantage over cocaine for anesthesia of the intact mucosa. It is more efficient than cocaine for anesthetizing the cornea, but

this advantage is offset by its greater toxicity. For paralysis of sensory nerve trunks it is only ½ as efficient as procaine and about 10 times as toxic.

Comparing butyn with cocaine in laryngeal work, Sir St. Clair Thomson (Brit. Med. Jour., Feb. 9, 1924) found that the former is slower in action, very much less effective, produces an irritating amount of secretion, and can evidently be extremely toxic. Of whatever value it may be in the eye, ear, nose or pharynx, it seems wholly disadvantageous in laryngeal work.

Dermatitis in a genitourinary specialist was traced to the use of butyn by A. M. Greenwood and J. F. Quest (Jour. Amer. Med. Assoc., Oct. 4, 1924). He was found also to react strongly to procaine, but not to cocaine or apothesin.

## C

CAFFEINE. - PHYSIOLOGIC ACTION.-According to L. E. Herzfeld (Monat. f. Kind., Oct., 1923), the action of caffeine in infants shows important differences from that in the adult. Infants bear relatively large doses without any change in the circulation or respiration. The customary dose of 0.05 Gm. (3/4 grain) several times a day is not always allowable, as it may be toxic in weak or badly injured infants. The harmful effects consist of repeated vomiting, particularly in children subject to this symptom; reduction of appetite; frequent, mucoid stools, ascribed to a nervous influence; elevations of temperature, and restlessness, peevishness and increase of crying. A pronounced increase of pulse rate was observed only in 2 out of 14 cases.

In regard to the action of caffeine on muscle, experiments by W. Hartree and A. V. Hill (Jour. of Physiol., May, 1924) suggested that this action is merely to release slowly and continuously the chemical processes, anaërobic or oxidative, normally induced suddenly and discontinuously by stimulation. According to Backman (C. r. Soc. de biol., Jan. 25, 1924), salts of caffeine and theobromine act not only on the muscles but also on the sympathetic nerve-terminals. Similarly, Frédéricq and

Radelet (Bull. de l'Acad. roy. de méd. de Belg., Dec. 29, 1923) found that in frogs caffeine exerts first a stimulant, then a paralyzing action on the sympathetic. Drossbach (Klin. Woch., Mar. 19, 1923) observed with the hematocrit that the volume of the *erythrocytes* is increased by caffeine.

The action of caffeine in persons of advanced age is discussed by O. T. Osborne (Med. Jour. and Rec., Dec. 3, 1924). Such persons, while feeling the need of stimulation, find that coffee or tea taken at the evening meal causes them to be wakeful. At other meals, however, they are inclined to increase the amount of caffeine stimulation. The drug increases general nervous irritability, causes palpitation, polyuria, and especially stimulates the thyroid and parathyroids, with resulting further increase of nervous and muscular irritability and trembling. It often raises the blood-pressure, and is likely to increase the production of uric acid, which in old people is especially likely to irritate the kidneys and cause muscle and joint pains. Thus, except in emergencies, caffeine stimulants can do nothing but increase the troublesome symptoms of old age.

THERAPEUTICS.—As a temporary stimulant caffeine is the only drug, accord-

ing to W. W. Duke (Jour. Amer. Med. Assoc., Apr. 7, 1923), which in his experience has never completely failed, provided it be given intravenously. In an aged man with bronchopneumonia who suddenly became nearly moribund and practically pulseless, with deep coma and Cheyne-Stokes breathing, intravenous injection of 2 grains (0.12 Gm.) of caffeine sodio-benzoate was followed by prompt return of consciousness and a good pulse and respiration for 24 hours, after various other drugs had failed. Similar results were obtained in moribund cardiorenal cases; uremia with coma and general sepsis with coma. Often the drug was repeated 2 or 3 times with good effect. In 1 case its repeated use seemed to bring about recovery from an illness otherwise almost certain to have been fatal. Subcutaneous use is far inferior, and interferes with sleep. Intravenous injection in particular brightens up consciousness and gives improved control of the vital reflexes, with resulting betterment of breathing, circulation, etc. The measure might also be used where other remedies fail in shock, collapse under anesthesia, and poisoning by morphine and other depressants.

While disapproving of coffee in the temperamentally unstable, in dyspeptics and in children, G. M. Niles (Jour. So. Carol. Med. Assoc., Apr., 1924) states that in those of an equable poise and whose digestion is not awry, it acts as a mild gastric and cerebral stimulant. Strong coffee, with or without a little lemon juice, is often useful in overcoming a malarial chill or a paroxysm of asthma. It is frequently serviceable in migraine, and ranks high in shock.

CALCIUM.—PHYSIOLOGIC ACTION.—The clinical effects of intravenous injection of 10 c.c. of a 5 per cent. solution of calcium chloride have been described by F. M. Pottenger (Amer. Jour. Med. Sci., Feb., 1924) thus: At an injection rate of 4 to 5 minutes for the 10 c.c., a slight facial flush is noted and the patient is conscious of a feeling of warmth more pronounced in the face and in and over the abdomen. The blood-pressure rises 5 to 10 mm. Hg, but usually returns to normal within 30 minutes. The pulse-rate in

asthmatics may drop 10 to 20, and remain at the lower rate for a short time. Upon more rapid injection the patient complains of a feeling of intense heat in the skin and breaks out in a profuse perspiration. There is a feeling of constriction in the throat and nausea, persisting for upward of 30 minutes; also a burning in the rectum. One patient developed aphonia, lasting for a few minutes.

As regards the action of calcium on the heart, L. Brull (C. r. Soc. de biol., July 11, 1924) found the cardiac contractions strengthened by it in the isolated heart of the dog and rabbit. Moderate amounts caused slowing of the rate through stimulation of the vagus center, while large amounts caused transient auriculo-ventricular dissociation. A rise of blood-pressure resulted from contraction of the peripheral vessels. No diuretic effect was observed. F. Haffner (Arch. de cardiol. y hemat., May, 1924) noted in the frog's heart that diastolic relaxation is rendered slower and less complete by calcium, with final arrest in systolic contraction. Such substances as potassium chloride, narcotics and acids act oppositely in this respect. E. Billigheimer (Zeit. f. klin. Med., July 25, 1924) calls attention to a close similarity in the action of calcium and that of digitalis in man. This similarity applies also to the seat of the action. Each agent enhances the action of the other. The digitalis effect is, however, more prolonged.

E. Baráth (Med. Klin., Nov. 16, 1924) observed, upon intravenous injection of calcium chloride, an initial stage of stimulation of the vagi previous to the appearance of evidences of stimulation of the sympathetic.

In view of the recent practice of giving preoperative intravenous injections of calcium chloride in cases with obstructive jaundice, J. P. Bowler and W. Walters (Jour. Amer. Med. Assoc., Oct. 18, 1924) investigated in dogs the possibility of injury to the structure or function of the kidneys by this procedure. No deleterious renal effects could be demonstrated. The same writers (Ann. of Surg., Oct., 1924) found in experiments that the toxicity of intravenous calcium injections increases with the speed of injection; hence the necessity of slow injection.

METABOLISM .- According to investigations by S. V. Telfer (Quart. Jour. of Med., Apr., 1924), absorption of calcium is initially dependent on the free acid of the gastric juice, which plays an important part in the solution of calcium salts in the diet. Absorption is normally restricted by the alkaline reaction of the intestinal secretions, which tend to neutralize and so precipitate the lime as an insoluble phosphate. To insure adequate absorption a marked excess of calcium in the diet is necessary. Absorption of phosphorus occurs freely even under pathologic conditions, but its fixation in the skeleton is dependent on that of calcium, failing which the phosphorus is re-excreted in the urine. According to W. J. Orr, L. E. Holt, Jr., L. Wilkins and F. H. Boone (Amer. Jour. Dis. of Childr., Nov., 1924), ingestion of an excessive amount of either calcium or phosphorus in the diet results in impaired absorption of the other, probably because of the formation of unabsorbable calcium phosphates.

According to C. R. H. Rabl (Münch. med. Woch. Apr. 11, 1924), the fate of calcium in the body depends on the reaction of the blood. If the hydrogen ion concentration is raised, more calcium is kept in solution, while if it falls, calcium deposition results. Frequent variations of blood reaction lead to increased calcium content of the bones, but a prolonged increase of hydrogen ion concentration leads to a migration of calcium from the bones to the blood. Rickets and tetany are opposite in that the former is attended with acidosis and the latter with alkalosis.

A. L. Daniels and G. Stearns (Jour. of Biol. Chem., Aug., 1924) found calcium and phosphorus retention in infants fed quickly boiled milk mixtures considerably greater than when the milk mixtures were pasteurized. The longer heat treatment of milk causes decreased availability of the phosphorus and calcium. A baby fed pasteurized milk over a long period receives too little calcium for his growth requirements.

H. Roger, L. Binet and M. Vagliano (C. r. Soc. de biol., July 11, 1924) find that the fats in the lungs contain both vitamin A and antirachitic vitamins which fix calcium in the system.

The X-ray causes, according to the observations of N. Piccaluga (Policlin., Nov. 15, 1924) in 7 patients, marked, but variable changes in calcium and phosphorus metabolism. Elimination of these substances is reduced by therapeutic, and increased by larger, doses of the rays. A summation of the action of sunlight, heat and the X-ray occurs when they are used together.

Investigating the blood calcium in various pathologic states, W. H. Jansen (Deut. Arch. f. klin. Med., Apr., 1924) found extreme degrees of hypocalcemia in chronic undernutrition and in parathyroid tetany. Other conditions with low blood calcium were epilepsy, syphilitic aortitis or aneurism with myocardial insufficiency, general asthenia or neurasthenia, hypothyroidism, some cases of nephrosclerosis and of diabetes with acetonuria, and in the stage of exudation in lobar pneumonia. He regards hypocalcemia as 1 of the connecting links between ion action, the vegetative functions, and thyroid action. Von Meysenbug (N. O. Med. and Surg. Jour., Aug., 1924) also mentions some cases of active rickets and the uremia of nephritis as conditions with reduced blood calcium.

F. Glaser (Med. Klin., Sept. 7, 1924) observed marked variations in the blood calcium on different days in some cases of functional neurosis and emotional disturbance, including depression, dementia præcox, hysteria and acrocyanosis. According to Kylin (Acta med. scand., Jan. 1, 1925), the ratio of the calcium to the potassium ions is of greater significance to the body than the actual concentration of these ions.

THERAPEUTICS .- While subcutaneous or intravenous administration of calcium was found by W. H. Jansen (Deut. Arch. f. klin. Med., Oct., 1924) to raise the blood calcium to normal and maintain it there for some time in adults in whom it had previously been low, these procedures failed to raise an already normal blood calcium for any notable time. By mouth, doses of soluble salts equivalent to 1 to 1.5 Gm. (15 to 23 grains) of calcium were required to cause even a temporary increase in the blood calcium. Of the inorganic calcium salts, calcium bicarbonate was the most effective in raising the blood calcium. Of the organic salts, calcium lactate had no effect on blood calcium, while calcium

acetate increased it slightly. A pure solution of calcium bicarbonate was found to increase the blood calcium by 50 per cent. while the same quantity of calcium carbonate in a mineral water increased it only about 10 per cent.

According to Petzetakis (C. r. Soc. de biol., Aug. 12, 1924), intravenous injection of 5 to 10 c.c. (80 to 160 minims) of a 10 per cent. solution of calcium chloride is capable of overcoming various arrhythmias, such as premature contractions, paroxysmal tachycardia and even auricular fibrillation. The attendant subjective symptoms are simultaneously relieved. The drug seems to be an actual heart-tonic.

R. Kaewel (Zeit. f. klin. Med., May 15, 1924) alludes to favorable effects obtained from calcium in anaphylactic shock and various vagotonic states such as nervous hyperacidity, vagotonic diarrhea, membranous enteritis, and chronic diarrhea following dysentery. In premenstrual pains not due to local pathologic conditions, calcium proves useful, as also in urticaria, excessive skin reactions to drugs or light, and chilblains. In tuberculosis it is serviceable for the palliation of nightsweats, hemoptysis and a persistent subfebrile temperature. It is also an antidote in poisoning by arsenic, arsphenamin, oxalic acid, quinidine or cocaine.

In asthma, K. Blühdorn (Klin. Woch., July 8, 1924) finds the giving of 1 table-spoonful of 5 per cent. calcium chloride solution every 2 hours very useful. For intravenous injection of calcium he uses a 10 per cent. solution of the crystallized salt. Occasionally anorexia, constipation and vomiting occur as untoward results of calcium treatment.

According to F. M. Pottenger (Amer. Jour. Med. Sci., Feb., 1924), a stimulating effect of calcium on sympathetic nerve action accounts for its value not only in asthma but also in intestinal tuberculosis, hay fever, acute rhinitis, serum disease, and other conditions attended with excessive parasympathetic irritability. In a case of anaphylaxis due to injection of horse serum, intravenous injection of 5 c.c. (80 minims) of a 5 per cent. solution of calcium chloride brought relief.

In 2 cases of nephritis with edema, N. M. Keith, C. W. Barrier and M. Wheelan

(Jour. Amer. Med. Assoc., Aug. 30, 1924) observed diuresis and loss of edema under calcium treatment. Study of inorganic ions during the diuresis showed a positive balance of calcium and a negative balance of chlorine and sodium. Upon ingestion of calcium chloride, calcium is eliminated by the bowel and chlorine by the kidney. In certain cases, sodium (becoming attached to the absorbed chlorine) is discharged in large amounts and water is thus made available for elimination and is excreted. The 1st case was one of subacute glomerular nephritis with extreme generalized edema of 9 months standing in a man of 22 years. In conjunction with other treatment, calcium chloride was given by mouth in periods of 7, 10 and 9 days and in doses of 18 or 10 Gm. (280 or 154 grains) a day, with the result that the weight was reduced from 92.7 to 55.4 kilos. in 65 days. The daily output of urine rose at times as high as 2200 c.c. The 2d was a less severe case in which 10 Gm, of calcium chloride for 4 days caused a sustained diuresis and disappearance of edema. At the end of the diuresis both patients had normal renal function. The drug was administered in capsules. L. G. Rowntree (Ibid.) notes that the most impressive feature of calcium as diuretic is that it is most effective in cases in which other procedures have failed. The types of edema that are often the most resistant have yielded readily to calcium chloride in several instances.

CAMPHOR.—PHYSIOLOGIC ACTION.—According to R. St. A. Heath-cote (Jour. of Pharm. and Exp. Ther., Apr., 1923), camphor, as well as thymol and menthol, depress the isolated heart of both the frog and rabbit directly, but dilate the coronary vessels. In anesthetized animals camphor, however given, does not cause a rise of blood-pressure if the dose administered is not sufficient to cause convulsions.

Nakazawa (Tohoku Jour. of Exp. Med., July 30, 1923) states that camphor paralyzes impulse formation and conduction in frog hearts, and in large doses stimulates the latent automatism. The favorable effects of camphor in strophanthin and aconitine poisoning are due to its para-

lyzing action on the abnormally irritated heart muscle.

H. M. Marvin and J. D. Soifer (Jour. Amer. Med. Assoc., July 12, 1924) refer to the diversity of opinion existing as to the value of camphor as a circulatory stimulant. Fourteen patients with advanced congestive heart failure and 2 normal subjects were given intramuscular injections of camphor in oil in repeated small doses and single large doses, the total amount varying from 0.6 to 3 Gm. (9 to 45 grains). No evidence was obtained that the camphor had any action on the heart rate, respiration, blood-pressure, vital capacity, electrocardiogram, or general clinical condition. Subsequent administration of digitalis resulted, in 10 out of 12 of these patients, in prompt, definite improvement.

TOXICOLOGY.—Two cases of death from pulmonary fat embolism following intravenous injection of 1 and 5 c.c. of camphorated oil are reported by Fabricius-Moller (Ugeskr. f. Laeg., May 31, 1923), illustrating that this procedure is not free from risk. The 1st case, receiving only 1 c.c., had a phlebitis following an operation for gall-stones, and received digitalis intravenously along with the camphorated oil.

G. Sabatini (Policlin., Jan. 5, 1925) lays stress on the intolerance of cases of discase of the liver and bile passages for camphor. Such symptoms as vomiting, weakness, feeble pulse and dry tongue may result. The condition is ascribed to deficiency of glycuronic acid to combine with the camphor, on account of the hepatic disturbance.

In a case of bilateral camphorated oil tumors in the thighs, O. Cignozzi (Rif. med., July 16, 1923) obtained reduction of the tumors by one-half through rest in bed for 10 days and ice applications. Further reduction was secured with mercurial ointment.

THERAPEUTICS.—The duration of unconsciousness in morphine and in carbon monoxide poisoning is shortened, according to E. Schilling (Deut. med. Woch., Nov. 2, 1923) by intravenous injection of camphor in oil. In marked collapse benefit is likewise obtained.

According to E. Ahlswede and W. Busch (Clin. Med., July, 1924), the best results from internal use of camphor are obtained in heart weakness appearing in the course of infectious diseases, such as influenza. In spastic stenosis of the pylorus these writers claim to have seen notable improvement following protracted administration of camphor; likewise, in several instances, in spastic occlusion of the bile-ducts. In exophthalmic goiter, striking improvement in the thyrotoxic manifestations follows internal use of camphor in conjunction with minute doses of iodine. The tachycardia and restlessness are allayed by additional of parenteral non-specific protein Pototsky is quoted as having favorably influenced nocturnal enuresis by oral use of camphor. Where camphor is used to reduce spasm of smooth muscle fibers, its effect is increased by added use of papaverine. When the optimal results from continued ingestion of camphor have been obtained, the dose should be markedly diminished, to obviate possible cumulative effects.

CANCER.—ETIOLOGY.—Recent research has developed a number of interesting points in relation to irritation and trauma as a factor in cancer induction. As stated by A. Leitch (Brit. Med. Jour., July 7, 1923), evidence has been obtained that certain irritants easily produce cancer, while others do not. 'The specific irritant produces cancer only in certain animals, and only in the susceptible tissues of these animals. A considerable period may elapse between the action of the irritant and the appearance of the neoplasm. A bias toward malignancy may have been imparted to certain cells by some long preceding irrita-Cancer is not essentially a disease of ageing tissue. The protracted period required in most instances by the causal agent to bring it on accounts for the fact that it is

usually a disease of middle or old age. The same observer (*Ibid.*, Nov. 22, 1924) reports experiments showing that *refined mineral oils*, such as are used for machine lubrication, are capable of producing skin cancer after long exposure, and which support the contention of Southam and Wilson that mulespinner's cancer of the scrotum, is due to several years' contact with lubricating oils.

In a series of experiments illustrating the cumulative action of irritations inducing cancer, Deelman (Nederl. Tijd. v. Gen., July 26, 1924) noted a marked uniformity in the number of applications of tar to the ears of white mice required before the 1st visible evidences of change in the tissues appeared, irrespective of the intervals between the applications. Thus, 22 applications were required when made at 2-day intervals, and 18, when made at 7-day intervals. On the other hand, once this stage of initial visible change was reached, a malignant aspect developed in a definite further period of 50 to 60 days, irrespective of continuance of the irritation.

In rabbits in which cancroids on the ear were induced by tar, crude paraffin oil, etc., M. Borst (Zeit. f. Krebsf., Aug. 26, 1924), observed that swelling, inflammation, and microscopically carcinomatous nodules were more pronounced and appeared more quickly in animals given cholesterol in addition to the ordinary diet than in controls. M. Händel (Ibid., July 15, 1924) found the growth of mice cancers seemingly favored by the feeding of potassium, and slightly hindered by calcium. F. Ludwig (Schweiz. med. Woch., Mar. 6, 1924) observed that mice fed on food lacking in vitamins exhibited a resistance to cancer inoculation as compared to control animals.

According to A. Lumière (Néoplasmes, May-June, 1923), cancer in scars following traumatism inflicted on the tissues either from without or within arises as follows: The contraction of the scar partly cuts off the circulation from the local cells, causing them to revert to a less differentiated, more embryonal type. After the lapse of some time and the application of trauma to the cicatrix, its cells, which have acquired a greatly increased faculty of proliferation on account of their embryonal retrogression, begin to divide, cancer resulting. A factor in prophylaxis is, therefore, to avoid sources of injury to the skin, alimentary tract or other organs, or if scarring already exists, to protect it against injury.

Numerous contributions on heredity or familial relationship as factors in cancer have been appearing. Leo Loeb (Jour. of Cancer Res., July, 1924) distinguishes 3 classes of cancer: (1) A class in which inner factors of a hereditary character play the principal part, as in glioma of the retina. (2) A class resulting from a combination of inner hereditary factors and well-defined stimuli. (3) A class in which stimuli play the essential rôle. The longer the stimulus acts, whether it be an internal secretion or a chemical agent, the greater the number of cancers developing. Also, the longer the stimulus has acted, the earlier in life the cancers appear; if the quantity of the stimuli has been sufficiently great, cancer can develop at a time when the stimulus has long ceased to act.

Evidence has been accumulating that resistance to cancer is a Mendelian character. In a study from the Netherlands Cancer Research Institute, dealing with a large number of clinical cases, Wassink and Van Raamsdonk (Néoplasmes, Aug., 1923) demonstrated a familial predisposition to cancers of varying location in 13 to 39 per cent. of various types of cases and a predisposition on the part of a certain organ in 9 to 39 per cent. Reference is made to Slye's research as having apparently determined that cancer heredity is a recessive quality. For this reason, one always observes less evidences of heredity than actually exist.

The recessive character of cancer is illustrated in 12 families traced for 4 or 5 generations by J. van Dam (Nederl. Tijd. v. Gen., Jan. 5, 1924), indicating that the occurrence of cancer is more familial than hereditary. Thus, in 1 family no cases of cancer were known in the 1st generation, but there were 15 in the 2d; 6 in the 3d, which had 3 or 4 times as many members as the 2d, and none in the 4th. Intermarriage with a cancer family was not followed by development of cancer with any regularity.

C. Fiessinger (Bull. de l'Acad. de méd., Mar. 4, 1924) recommends emphasis of the fact that it cannot now be definitely asserted that cancer is not a transmissible disease. He alludes to a group of houses in a small village in which there were 10 deaths from cancer in 14 years, and to Bazin's observation of 8 cases in a group of 7 houses, as well as of 3 instances in which dogs and their masters successively developed cancer.

The parasitic theory of cancer is favored by F. Blumenthal, H. Auler and P. Meyer (Zeit. f. Krebsf., Aug. 26, 1924), who, from the extreme outer zone of 8 beginning human cancers, obtained bacilli of the B. tumefaciens group. These organisms,

when inoculated in plants, mice and rats, induced tumor development at the points of inoculation. In the rats these tumors could be cultivated through many generations, at times grew very large, and induced metastases. They were prone to recede, however, unless kieselguhr was added to the cultures. W. M. F. Robertson (Lancet, Aug. 18, 1923) demonstrated an anaërobic diphtheroid bacillus and a mannite nonfermenting staphylococcus in 15 cases of malignant disease, as . well as streptococci in \(^2\)\_3 of these cases. These bacteria are regarded as responsible for the tumor proliferation. J. Young (Brit. Med. Jour., Jan. 10, 1924) reports having obtained an organism with a complex life history almost constantly from cancer. It is credited by him with yeast, coccal, bacillary and amorphous phases. In the latter phase it lives in symbiosis with the cancer cell. It belongs to a type of bacteria that is widespread in nature, and tissue susceptibility, wherever it occurs, therefore involves an immediate risk of infection with it.

J. W. Nuzum (Surg., Gyn. and Obst., Mar., 1925) has isolated a micrococcus in pure culture from 38 out of 41 early human breast cancers, from metastases in the axillary glands, and from metastatic growths disseminated throughout the body. It is identical culturally and morphologically with an organism previously isolated from the transplantable cancer of the mouse. It is cultivated in dextrose broth, with or without ascitic fluid. In early cultures its size averages 0.1 to 0.3 micron. It is extremely pleomorphic, and stains best by Gram's method or the Giemsa stain. Animals inoculated with it developed typical cancer and metastases, from which it could be isolated anew. In a patient suffering from a hopelessly inoperable cancer, repeated subcutaneous injections of the micrococcus in a distant part of the body produced a typical cancer.

G. A. Soper (*Ibid*.) calls attention to the fact that Nuzum's work does not prove that cancer can be caused by his micrococcus alone nor that it is frequently produced by it under conditions other than those of the laboratory. It is not proved that some other microbe might not have given like results.

Data bearing on the relationship of endocrin influences to cancer are afforded by the experiments of W. H. Brown, L. Pearce and C. M. Van Allen (Jour. Amer. Med. Assoc., June 30, 1923) on a transplanted rabbit tumor. In thyroidectomized animals the tumor grew steadily and rapidly. Where the thymus was removed it grew slowly, as in old animals. After partial thyroidectomy, the tumor at first grew rapidly, but was brought under control. After complete thyroidectomy very widespread metastases occurred in all this operation cases, increasing malignancy. H. Auler (Zeit. f. Krebsf., May, 1924), discussing the question of "neoplastic diathesis," adduces arguments supporting a connection between involution of the sex organs and cancer production. Many women with carcinoma exhibit stigmata of virilism, such as hypertrichosis, and in pseudohermaphrodites tumors are very common. Lickint (Münch. med. Woch., Jan. 16, 1925) calls attention to a relationship of delayed onset of menstruation to cancer. In 25 cases menstruation had begun between the 16th and 20th years.

Overfeeding with *glucose* or injection of *insulin* was observed by M. Händel and Tadenuma (*Ibid.*, June 27, 1924) to be followed by rapid development of cancer in rats.

According to Sir W. A. Lane (Pract., Apr., 1924), cancer is, with rare exceptions, as much 1 of the results of chronic intestinal stasis as are appendicitis, colitis, diverticulitis, gastric and duodenal ulcer, etc. He describes a series of changes spreading through the alimentary tract, with impaired fecal flow and inflammation of mucous membranes, with resulting absorption of poisonous material and fouling of the nutritive supply all over the body. An excessive strain is meanwhile thrown on the ductless glands, which hypertrophy at first, but later degenerate and atrophy. The frequency of cancerous changes in the breast and ovary is ascribed to the early cessation of functional activity of the sex organs in the female. Cancer never attacks a healthy organ or tissue.

Freund and Kaminer (Wien. klin. Woch., Dec. 6, 1923) present evidence of a change of the intestinal chemistry in cancer which is not secondary, but precedes the development of the tumor and persists even after radical operation.

PATHOLOGY.—In experiments designed to bring out the essential characteristics of a malignant cell, A. Carrel (Jour. Amer. Med. Assoc., Jan. 17, 1925) inoculated cultures of normal large mononuclear leukocytes with a filtered extract of the Rous sarcoma, and found that after about 20 days' incubation these cells, upon inoculation into fowls, caused a rapidly growing tumor which ultimately killed the animal by metastases. Observation of such infected mononu-

clear leukocytes in vitro showed that, instead of continuing to live like normal mononuclears, they usually developed vacuoles and granulations after 3 or 4 days, exhibited less of migration and multiplication, and then progressively disappeared by a process of digestion, though inoculation of the clear supernatant fluid nevertheless induced fowls highly malignant tumors in a short Thus, the penetration into large mononuclears of the agent of Rous sarcoma gave those cells the property of secreting the Rous agent and of dying prematurely. Yet such cells are far from being anarchic, or from possessing as much growth energy as an embryonic cell, as is supposed according to the classical

hypotheses.

That such cells of low resistance and short life can build up a tumor having the power of unlimited growth in the body is accounted for as follows: When the Rous agent enters a fowl, it is soon destroyed by the humors unless it is taken up by a tissue macrophage or a monocyte. The infected macrophage continues to multiply and infect other macrophages, though it eventually dies. Then the dead macrophages attract normal macrophages, which become modified in their turn. Meanwhile, the growth-promoting substances in the macrophages are set free, and bring to the fibroblasts and other cells of neighboring tissues the food material and stimulus necessary for multiplication. Since the Rous agent propagates itself within the cells, this process can go on indefinitely. Thus, herein, the macrophages are no longer defenders against bacteria and foreign substances, but actually protect the Rous agent against destruction by the humors.

A pronounced sugar-destroying power of cancer cells has been emphasized of late. O. Warburg and S. Minami (Klin. Woch., Apr. 23, 1923) found that surviving sections of rat carcinoma formed at least 70 times as much lactic acid from sugar as other rat tissues. The tumor can thus decompose its own weight of sugar in 13 hours and form 7.5 per cent. of its weight of lactic acid every hour. This process is inhibited by narcotics, but not by absence of oxygen, K. Glaessner (Wien, klin. Woch., Apr. 10, 1924) found lactic acid in the urine of most cancer cases as well as of cancerous mice after intravenous injections of glucose solution. These observations are in harmony with the fact noted by A. Braunstein (Klin. Woch., Apr. 29, 1924) that when cancer develops in a case of diabetes the glycosuria ceases, the patient becomes tolerant of carbohydrates, the sugar content of the blood decreases as the disease progresses, and the glycosuria reappears if the cancer is excised. Indeed, in 9 cases, in spite of complete destruction of the pancreas by cancer, no glycosuria appeared.

Iodine and adrenalin were found by J. Carra (Tumori, Oct. 15, 1923) in experiments in vitro to be adsorbed more strongly by cancer cells than by other tissues. In a study of the inorganic constituents of the serum in cancer, R. C. Theis and S. R. Benedict (Jour. of Cancer Res., Dec., 1924) found the calcium, potassium, and phosphorus content lowered. The excess of base radicals over acid radicals was lowered by 16 per cent. in advanced cases.

DIAGNOSIS.—Itching is deemed of significance by H. Küttner (Zent.

f. Chir., Apr. 19, 1924) as a premonitory symptom of malignant disease. Two cases of cancer of the stomach complained of increasingly severe generalized pruritus for several months before the 1st gastric manifestations of cancer appeared.

Fever in cancer was studied by L. H. Briggs (Amer. Jour. Med. Sci., Dec., 1923) in 238 cases, and was observed at some time in 38.2 per cent., independently of any known complications. The highest percentage of fever was in growths of the lung and liver, while in the case of other organs the fever incidence was rather close to 33 per cent. Isolated rises of temperature were noted chiefly. Metastases did not seem to influence the incidence of fever.

In a case seen by M. Roch and G. Bickel (Bull. Soc. méd. des hôp. de Paris, June 1, 1923), fever occurred in regular waves of 7 to 12 days, each febrile attack presumably corresponding to a cancerous invasion of the blood-stream, since no septic complications were found at the autopsy. Anemia was severe in this case, eventually becoming pernicious.

Various aspects of the clinical laboratory diagnosis of cancer are discussed by J. Ewing (Jour. Amer. Med. Assoc., Jan 3, 1925). The frozen section immediately reveals the nature of many tumors, but usually only those which an experienced pathologist can recognize by gross examination. It can be applied only to those portions of tissue which are selected as most suspicious. Having made more errors by the frozen section method in breast cases than by the gross examination, he has not employed it in this field for many years. As a rule, tumor tissue and infiltrated structures present features easily recognized by sight and touch. When papillary adenomas arising in cysts become cancerous, the fact is revealed by greater opacity, chalky streaks, and fixation of the capsule of the cyst. Axillary lymph-nodes, atrophic, but invaded by fat tissue and very firm and encapsulated, are often mistaken for cancerous nodes. True cancer renders the nodes rigidly hard and very opaque.

Roentgenography has greatly enlarged the opportunities for the study of the gross anatomy of tumors. It should correspondingly diminish the indications for biopsies and exploratory operations. Few bone tumors cannot be somewhat accurately classed by means of roentgenograms and clinical signs.

The indications for a biopsy are in inverse proportion to the skill and experience of the surgeon and pathologist in interpreting the gross signs of tumors. Yet often it is indispensable. Removal of a small, carefully selected portion of an accessible tumor seldom does harm, though cutting through the skin to excise a portion of a breast tumor is generally to be discountenanced. It is better to remove the whole tumor and follow immediately by the procedure indicated by the results of pathologic diagnosis. Incision of encapsulated malignant tumors growing under pressure is nearly always harmful. The therapeutic test by radiation is generally far better and safer. Incision into bone tumors is one of the last steps to be taken in diagnosis. The grounds for preferring the cautery over the sharp knife in biopsy have never been satisfactorily established, and the writer prefers the knife. Correct diagnoses may at times be made on fragments of tumor tissue in the sputum, stomach washings, urine and other excreta.

Interesting diagnostic aids from radiation have come to light of late. Giant-cell tumors of bone respond to external radiation by preliminary swelling followed by regression and restoration of the shaft, while most osteogenic sarcomas show no such changes or respond very slowly. Very cellular myelomas and other round cell tumors also yield promptly to radiation, while tumors that form bone or much interstitial tissue are resistant. lymphosarcomas melt down rapidly, while Hodgkin's granuloma is more resistant and generally leaves cicatricial masses. Simple hyperplastic tuberculous lymph-nodes gradually recede under radiation, unless there is caseation and suppuration. Areas of

chronic mastitis become swollen and indurated, while cancerous masses generally recede notably and leave very hard cicatrices.

Irregular bleeding from the uterus, however slight, calls for a biopsy, according to Siredey (Bull. de l'Acad. de méd., July 10, 1923), who thus detected 8 cases of incipient uterine malignancy. If the hemorrhage continues, initial negative findings should not be held conclusive.

SERUM AND OTHER TESTS .-Botelho's serum reaction, as described by Sabrazès and Muratet (Arch. des mal, du cœur, Dec., 1923), is performed thus: Equal parts of fresh serum from the patient and of 0.75 per cent. sodium chloride solution having been mixed, 0.5 c.c. of this mixture is diluted with 2 c.c. of a solution consisting of citric acid, 5 Gm.; commercial formaldehyde solution, 1 c.c., and normal saline solution (or better, distilled water), 100 c.c. Then there is added 0.7 c.c. of a solution of iodine, 1 Gm., and potassium iodide, 2 Gm., in water, 210 c.c. A positive result is shown by the appearance of turbidity on standing, while a negative result is confirmed by persistent clearness after further addition of 0.2 c.c. of the iodine-iodide solution. The writers found this test positive in about 75 per cent. of cancer cases. The response is also frequently positive in chronic myeloid leukemia, typhoid fever, Banti's disease and pregnancy. When it is negative, cancer is practically excluded. Peyre (Bull. méd., Sept. 27, 1924) deems this test of diagnostic service.

S. Gussio (Tumori, Aug. 5, 1923) found the serum globulin always increased and the serum albumin decreased in cancer. In debility from other causes a similar tendency was seen, but in cancer the abnor-

mality was more marked and earlier in advent, occurring while the general health was still but little affected. According to Kennaway (Quart. Jour. of Med., Apr., 1924), however, the increase of globulin seldom occurs early enough to be of diagnostic utility.

R. Fischer (Bull. de l'Acad. de méd., Jan. 16, 1923) has described a test based on the fact that coagulation of the serum by alcohol is less pronounced after addition of 1:500 gelatin solution than after addition of normal saline solution in early cancer, cachexia and paroxysmal hemoglobinuria, whereas in other conditions the converse is the case.

V. E. Mertens (Deut. Zeit. f. Chir., May, 1923) observed that intracutaneous injection of scrum from cancer patients under X-ray treatment caused a characteristic local reaction in the form of a purplish spot in other cancer cases. F. Hoff and K. Schwarz (Münch. med. Woch., June 20, 1924) confirmed this, 14 cases giving a positive response at some time, while all but 3 of 17 controls were negative.

J. Thomas (Monde méd., June 1 and 15, 1924) had found, with M. Binetti, that serum from a cancer case, mixed with tumor extract, decolorizes a glycerinated solution of methylene blue much more rapidly than normal serum. He reports a number of cases illustrating the value of this test in the diagnosis of doubtful cases of malignancy.

According to W. Simon (Zent. f. Gyn., Oct. 25, 1924), alimentary leukopenia occurs in 90 per cent. of all cases of cancer of the female reproductive organs. This may be of diagnostic and prognostic service. H. Seidl (Münch. med. Woch., Dec. 5, 1924) has confirmed Simon's observations.

Blood scdimentation [see Blood, this Volume] was found always accelerated by Gragert (Arch. f. Gyn., Apr. 16, 1923) in 70 cases of cancer of the female reproductive organs. He regards this as reflecting a toxic action of the tumor on the system, but sedimentation did not return to normal until over a year after removal of the tumors. Roffo (Prensa méd.

Argent., July 10, 1924) similarly found sedimentation greatly accelerated in 101 cancer cases as compared to 33 persons either normal or with non-cancerous conditions. superficial growths, however, did not affect sedimentation. Troise, de Marval and Rovere (Semana méd., June 26, 1924) observed a slowly progressive acceleration of sedimentation in cancer, while in hydatid disease there was no acceleration until suppuration set in, when abrupt acceleration occurred.

The glucose tolerance test was used by S. K. Simon and J. H. Smith, Jr. (So. Med. Jour., Aug., 1923) in 15 cases of cancer in which the diagnosis was definitely proved. Of these, 10, or 66% per cent., yielded a sustained typical or atypical blood sugar curve of diagnostic utility.

A urinary methylene blue test is described by J. Fuhs and W. Lintz (Néoplasmes, Mar. and Apr., 1923). A little Loeffler's methylene blue is added to the urine and the latter incubated for 12 or 24 hours. Decolorization occurs in cancer cases and a few other conditions, such as acute rheumatism and nephritis.

TREATMENT.—The advantages to be derived from the surgical treatment of cancer are alluded to in the statement of E. S. Judd (Jour, Amer. Med. Assoc., Jan. 3, 1925) that surgery has done more for persons suffering from this disease than all other methods of treatment combined. It is not right to consider cases hopeless without first making a careful estimate of the grade of malignancy and of all other factors. The writer ascribes great value, in relation to the results to be expected from removal of the growth in the

individual case, to Broders's system of grading the malignancy of tumors according to the microscopic picture. This is based on the ratio of differentiated to undifferentiated epithelium in the tumor, which is as follows in the several grades: Grade 1, about 3:1; Grade 2, about 1:1; Grade 3, about 1:3; Grade 4, no tendency to cell differentiation. The number of mitotic figures and of cells with large, deeply staining nucleoli plays an important part in the grading. The more the neoplastic cell tends to differentiate or approach in structure a normal cell, the lower the degree of malignancy. In certain cases in which the condition seems very extensive, there may yet be a chance of cure by complete eradication. On the other hand, Broders's method has foreshadowed recurrence in spite of an apparently complete operation in a number of cases by indicating a higher grade of malignancy than usually exists in the region, and is useful in preventing operation on a certain group of patients for whom treatment is of no avail.

A high percentage of cures is possible, according to Judd, upon wide excision of epitheliomas of the head, face and neck at a fairly early stage, as they almost always remain local, in spite of the very rich lymphatic drainage in this region. Epitheliomas of the larynx respond well to operation, but cancers of the thyroid usually do not. Gastric cancer affords good results if dealt with while still confined to a definite area of the stomach and if the degree of malignancy is not high. All gastric ulcers should be thoroughly excised, otherwise an actually malignant condition may be unwittingly allowed to persist. Cancer of the body of the uterus offers a favorable prognosis under surgery, while in cancer of the cervix radium seems almost a specific. Breast cancers, though accessible and usually recognized early, have not given better surgical results than cancers in other regions, probably because of greater malignancy. Chronic cystic mastitis need not always be treated surgically, but every solitary lump in the breast, or any unusual nodule in association with a diffuse mastitis, should be excised immediately for microscopic study. Cancers originating in the kidney, bladder and prostate, if not too highly malignant, do very well after complete surgical removal. Grading of kidney tumors by the cell differentiation permits of quite accurate estimation of the prognosis. One of the most discouraging problems to Judd is the attitude of some family physicians, patients with definite malignant growths coming for surgical treatment after having been under observation by their physicians for a year or more.

A. Fraenkel (Wien. klin. Woch., Jan. 31, 1924) states that the number of permanent cures after cancer operations is increasing on account of the greater frequency of early diagnosis and early radical operation. The fact is, however, that the period of latency of the cancer focus is often so long as to preclude its early detection. That cancer up to a certain time is a purely local proliferation is indicated by the many known instances of permanent recovery after removal of the cancer without removal of the glands and of arrest of the proliferation for years following a merely palliative operation. Removal of irritative factors does away with the inflammatory changes that have been breaking the ground for progression of the cancer, and through cicatricial replacement of inflammatory infiltrations a wall is placed about

the tumor. Again, early operation may be too late even in an easily demonstrated cancer when the growth extends through the blood to distant parts. Such migrating cancer cells may, however, be made harmless by encapsulation or other means of defence. The prospect for better surgical results in the future lies less in further extension of the operations than in enhancing the defensive processes of the organism.

RADIATION.—Radium and other non-surgical procedures are commended by W. H. Schmidt (Amer. Jour. of Roentgenol., Sept., 1924), not as rivals of, but as the greatest aid to successful surgery. The latter has its field in many internal and inaccessible growths, especially in the gastrointestinal tract; exposure of neoplasms for treatment by other agents; preliminary removal of gross masses, as in the breast; preliminary colostomy; cancer of the body of the uterus, etc.

The more embryonal in type the tumor cells, the more effective is All tumors of lymphatic radium. tissue, if accessible, are amenable to In metastasis to lymph glands, the writer prefers buried radium element, followed by external application of radium or the X-ray. Such glands should be removed only after thorough radiation. Cancer in proximity to large vessels and nerves should be treated with radium. In mammary cancer buried radium greatly aids the effects of the X-ray. It is also indicated in cancer of the prostate and bladder after surgical exposure, in recurrent glioma of the orbit, cancer of the tonsil, and in general, to conserve tissue if needful, as in certain advanced lip cancers or where the entire cheek is infiltrated.

The X-ray is to be used for widespread radiation, and where the lesion is at a distance from the skin. Many breast cancers can be successfully treated with it alone. The tendency now is to divide the dose. It is indicated for malignant glands; the glandular area in cancer of the cervix, rectum, bladder and prostate; any deep-seated, inaccessible growth unassociated with vital glands, such as the adrenal and pancreas; metastasis to the lungs and bones, and sarcoma.

The electrothermic method is very effective in basal-cell epithelioma of the face and extremities, cancer of the lower lip, cancers in the mouth, and for the destruction of indolent sloughs resulting from radium. It absolutely destroys all disease without devitalizing normal tissue, and healing is rapid, with a soft, pliable scar. Only rarely can the results not be improved by the use of 2 or more methods in a given case.

According to E. Opitz (Med. Klin., Sept. 9, 1923), what has been termed the "carcinoma dose" of the X-ray is merely the maximal, and not the optimal dose of the ray. Whereas cancer recurred in those of his cases treated with this maximal dose, most of the apparently cured cases had received small doses. The ray does not directly destroy the cancer cells, but causes the formation of chemical substances antagonistic to them and which may influence them even if the ray is not applied directly over the growth. Direct destruction of the cancer cells could not be effected without harming the surrounding normal tissues. The ray leads to stimulation of the vegetative nervous system, especially the vagi, and its effects resemble those of cholin.

Similarly, W. L. Clark, J. D. Morgan and E. J. Asnis (Radiol., Oct., 1924) believe, on the basis of clinical observations and histologic findings, that the normal reactions in the healthy tissues about a cancer can be aroused by a considerably smaller dose of radiation than has been customary. Normal cells play an important

part in the destruction of cancer cells. The embryonic, undifferentiated cells in a cancer are the dangerous ones and are also the ones that succumb most readily to a mild radiation dose. The dosage factors referred to are 220 kv., 4 ma., 50 cm., and an average time of 3 minutes twice daily for superficial lesions and 10 minutes once or twice daily for deep-seated lesions. Large portals of entry and cross-fire technic are used in order to cover all the surrounding lymphatics. If one can surround the cancer cells with sufficient leukocytes and keep up the supply by a continued body reaction, heavy irradiation dosage is unnecessary. A number of cases successfully treated by this method are referred to.

In regard to high voltage X-ray treatment, J. F. McCullough (Atlantic Med. Jour., May, 1924) emphasizes the advantages of homogeneous radiation with rays of short wave lengths, afforded by this method, in the treatment of deep-seated masses. He has found the method often applicable in cases previously considered inoperable, or which had failed to respond to other procedures. Cancers of the breast, uterus, bladder, antrum, mouth, and a mediastinal tumor were remarkably improved. The precise value of the method cannot, however, be stated as yet, for want of sufficient experience with it.

In contrast with this opinion, L. Herly (Jour. of Radiol., Mar., 1924) maintains that the old machines used in this country, with increased distance, filtration and time, will give results as good as the high-voltage apparatus. Intensive, high-voltage raying damages the normal tissues. Connective tissue damage breaks down the barriers to cancer cell invasion, while damage to endocrin glands reduces general resistance and may even be fatal.

Palliative X-ray treatment in advanced, inoperable, cachectic, hopeless cases of cancer, primary or recurrent, is advocated by Leddy and Weatherwax (Amer. Jour. of Roentg., May, 1924) on the basis of cases they describe. Fractional doses applied at intervals were used, with marked relief to the patients. Among the cases cited is 1 of a man aged 70, with gastric cancer and metastases in the mediastinum. Three erythema doses were given at 14-day intervals over the stomach region, without cross-fire. A year later the patient had no symptoms.

The late results of radiation in cancer are dealt with by G. Forssell (Amer. Jour. of Roentgenol., Oct., 1924) in a study of a series of cases treated since 1910 in a cancer hospital. Nearly all the cases were treated with radium, some receiving the X-ray in addition. In superficial, freely movable skin cancer, cure was obtained in 86.3 per cent. of 102 cases, while in infiltrating, fixed skin cancer, 51.4 per cent. of 105 cases were cured. This series included entirely inoperable cases and cases in which treatment was uncompleted. Of 40 cases of superficial cancer of the lower lip, 90 per cent. remained well after 5 years, and of 26 infiltrating cancers, only 34 per cent. In less than 10 per cent. of 257 cases of cancer of the skin or lip primarily recovering under radium did recurrences later occur which could not be cured by repetition of radium treatment. Of 505 cases of cancer of the cervix, 40.5 per cent. of the operable or borderline cases were free of symptoms 5 years after radium treatment, and 16.6 per cent. of the inoperable cases.

W. L. Clark, J. D. Morgan and E. J. Asnis (Radiol., Apr., 1924) consider electrothermic methods of cancer treatment as second to none, though surgery, radium and X-rays are all indispensable likewise, alone or in combination, to meet particular indications. Their procedure is entirely dissimilar from and superior to Keating Hart's fulguration, the thermocautery, galvanocautery and electrolysis.

In the desiccation method, heat is applied which is just sufficient to desiccate or dehydrate the tissues. The heat is produced by a monopolar high frequency of the Oudin type, and applied with a steel needle or other pointed applicator. Desiccation is used advantageously when the lesion is localized and good cosmetic results are essential. It results in little trauma to the tissues, little secondary inflammation and little scarring, and is therefore useful in removing growths from delicate structures such as the cornea and vocal cords. It is an important measure in malignant lesions of the skin and mucous membranes, as well as in many non-malignant conditions. Coagulation is a procedure distinct from desiccation and is produced by a bipolar high frequency current of the d'Arsonval type, using a multiple spark gap. It is more penetrating and intense than desiccation and is used for larger growths, even those involving bone. An indifferent electrode is required, and a current strength of 200 to 2500 ma. is used. Unlike the actual cautery, the heat is generated within the tissues by their resistance to the current, and a deeper action results.

With either desiccation or coagulation, the aim is to destroy the growth at a single operation. The devitalized tissue is, as a rule, immediately removed either by excision or curettage, usually accomplished without hemorrhage; on mucous surfaces, however, the destroyed tissue is usually allowed slowly to separate. The vitality of the surrounding normal structures is conserved by these methods. The latter should be used alone only in localized tumors of a

type which does not tend to metastasize. Basal cell epithelioma of the face, eyelids, etc., even though extensive, and with bone involvement, may be so thoroughly treated that recurrences are infrequent. In localized squamous cell epithelioma of the skin or mucous membranes, the results are almost as good; if metastasis has already occurred, other methods must be used in addition. In the bladder, larynx, etc., endoscopes are used to render the growth accessible to treatment. Malignant cells, especially the least differentiated, are devitalized at a lower degree of heat than normal cells. Histologically, desiccation results in a shrunken, elongated, mummified appearance of the cells and their nuclei, with round cell infiltration, while coagulation produces complete loss of cell outlines, a hyalinized appearance of the tissue, and thrombosis of the vessels. The writers present illustrations showing the results obtained in advanced cases of cancer or sarcoma of the nasal region, orbit, ear, eye, tongue, etc.

> Monopolar endothermy (desiccation) is likewise advocated by G. A. Wyeth (Boston Med. and Surg Jour., Oct. 9, 1924). In accessible epidermoid carcinoma, using as electrode an ordinary sewing needle in a suitable handle, he first makes a light ring of destruction in healthy tissue around the malignant growth. A specimen for the microscope is then taken with impunity, after which the growth itself is attacked with the needle and destroyed in situ. It is then curetted away, the clean base seared over with a brushing of the current, and a dressing applied.

> The same writer (N. Y. State Jour. of Med., Oct., 1924) refers to the endothermy knife as a recent development of a current of much higher frequency, dependent upon the more modern tube system for its oscillations. The current produces the effect of cutting without the use of a sharp knife. By searing as it cuts, it leaves a sterile incision. It supplements, but is not a substitute for, either monopolar or bipolar diathermy.

According to A. L. Yocom, Jr. (Jour. of Radiol., July, 1924), combined treatment by surgical diathermy and the X-ray offers better promise of a permanent cure than either method alone. Whenever possible, he irradiates the affected area both before and after the coagulation treatment, as well as later, after healing has occurred. The high-voltage X-ray treatment is employed.

R. C. Lounsberry (Jour. Mo. State Med. Assoc., Jan., 1925), a few days after electrocoagulation of squamous cell epitheliomas, uses the Finsen water-cooled rays, which he regards as assisting greatly in the resulting cosmetic effect. The rays are asserted to stimulate granulation as well as to aid in the elimination of by-products that are harmful to the growth of new cells.

MISCELLANEOUS MEASURES. -Autoserotherapy is advocated by Endler (Arch. f. klin. Chir., cxxvi, 176, 1923) as a procedure serviceable for the relief of pain and insomnia, restoration of appetite, and general reactivation in cancer cases. He obtains 20 or 30 c.c. of the patient's blood from a vein, places it in the icebox for 24 hours, warms the serum from it to body temperature, and injects 10 or 15 c.c. of it intravenously. Only exceptionally does a temperature reaction follow. Three injections at weekly intervals are usually given. Aside from the constitutional improvement, there results also more or less reduction of the local discharge and of the size of the tumor.

An autolytic product was found effective in several cases of basal cell cancer by Lamprecht (Derm. Zeit., Apr., 1924). It was prepared by subjecting cancer tissue to autolysis for 1 to 3 days in the incubator, sterility being insured thereafter by heating at 56° C. on several successive days. Marked improvement or even "temporary cure" followed the treatment.

A sex gland serum, tumorcidin, prepared by R. Deutschmann and W. Kotzenberg (Deut. med. Woch., Apr. 25, 1924), is claimed by them to be effective in a certain proportion of cases. Experiments had shown that such serum inhibits the growth of malignant tumors. It is prepared by injection of sex glands into normal animals, the production of substances which regulate the growth of the body cells being thus stimulated. The dose is 3 teaspoonfuls of serum by the mouth daily. Cases of improvement or clinical cure are reported, and the serum is deemed useful to prevent recurrences after operation.

In experiments on mice with the protein products of the endocrin glands (Abderhalden's optones), D. Engel (Zeit. f. Krebsf., Feb., 1923) observed that the pituitary seemed to promote tumor growth, while the thyroid and more particularly the thymus inhibited it. The testes and ovaries had no effect. He regards oöphorectomy as warranted in inoperable cancer of the breast on account of the thymic stimulation which results from it.

Theilhaber (Arch. f. Gyn., Apr. 16, 1923) advocates certain measures as indispensable adjuvants to excision or radiation, viz., sun baths and air baths, diathermy and venesection. Their purpose is to produce an infiltration of blood cells, especially lymphocytes, about the growth or the site from which it has been removed, thus enhancing the local immunity and hindering recurrence. Having applied these principles for 13 years, he reports a persisting cure in 32 out of 44 operated cancer cases, including 11 with an interval exceeding 5 years.

Matsushita (Deut. med. Woch., Jan. 4, 1924) states that of 3417 cases treated with carcinolysin in Japan, 64 per cent. were benefited, including 26 to 35 per cent. clinically cured. The drug is a ferment prepared from a Chinese variety of pine. Series of at least 30 subcutaneous or intramuscular injections are given, usually in doses of 1 c.c. (16 minims)

twice daily, though at first 3 c.c. (48 minims) may be used and the amount then reduced. F. Blumenthal (*Ibid.*, Feb. 29, 1924) observed marked improvement in 1 case of metastases following breast removal; over 50 injections were given in 3 months. The drug causes a general febrile reaction and a local reaction featured by pain in the region of the tumor, with reddening, softening and sometimes disappearance of the growth. Its exact value is not known, as it has been used only as a last resort.

W. Blair Bell (Lancet, Feb. 9, 1924) reports 122 cases treated with colloidal lead iodide preparations, usually administered intravenously. Little specific information on the mode of preparation or dosage is given. The patients usually complain of pain in the tumor in 2 to 8 hours after injection. Local redness may be noted. In favorable cases the mass seems to break up into separate smaller tumors. At this juncture the cases should be subjected to the X-rays. Sarcomas may soften, liquefy and be absorbed. Among the patients treated there was not a single early case. In most, the outlook was hopeless. Of the 122 cases treated between Nov. 9, 1920, and Nov. 9, 1923, there were 19 alive and believed cured on Dec. 21, 1923; 12 were arrested or improving, 12 had improved but later died, 30 had been unimproved, and most of the remainder had died from various causes or discontinued treatment. The treatment is deemed advisable in inoperable cases and to prevent recurrence in operated cases.

To subdue pain in cancer cases, J. R. Goyena (Sem. méd., Jan. 31, 1924) regularly uses quinine, injecting 20 or 30 c.c. (5 to 8 drams) of a 10 per cent. solution on alternate days and giving 2 tablets, each containing 0.5 Gm. (7½ grains), by mouth on the intervening days. This plan is followed for 20 days, the series being later repeated if the

pain recurs. The drug also exerts a tonic action.

According to D. M. Gall (Lancet, May 31, 1924), striking relief from pain, coffee ground vomiting, insomnia, etc., may result from oral use of liquor potassæ, given thus:

B. Liq. potass. hydrox... mxv (1 c.c.); Potassii nitratis ..... gr. x (0.6 Gm.); Aq. menthæ pip., q.s. ad ......... f3ss (15 c.c.).—M.

The dosage is ½ dram (2 c.c.) 3 times daily. From the 1st dose, patients sleepless for several nights slept 14 hours continuously, vomiting ceased and small nodules disappeared, while in 2 cases the tumor mass was greatly reduced in size. A possible specific effect on cancerous growths is discussed.

H. J. Ullmann (Radiol., Dec., 1924) lays stress on the maintenance of blood alkalinity after radiation treatment. The cases that do not do well are instances of acidosis, and if there is a starvation acidosis with acetonuria, postradiation vomiting results. This is obviated by placing the patients on a liberal but basic diet, free of meat, fish, bread and eggs, but with large amounts of orange juice, as long as possible before treatment. For anorexia and weak digestion, the writer recommends Sansum's expedient of giving pancreatic extract in increasing doses until it becomes effective, after which it can be stopped without loss of the benefit produced. The anorexia disappears in 48 hours under this drug.

CAPILLARIES AND CAPIL-LAROSCOPY.—The clinical procedure of capillaroscopy consists in placing castor or cedar oil or glycerin over the skin just above a finger nail and examining this area with the microscope under a magnification of 100× or less. Strong tangential illumination is required properly to display the capillary loops.

According to F. Groedel and G. Hubert (Zeit. f. klin. Med., May 15, 1924), an important function of circulatory regulation is carried out at the distal ends of the precapillary vessels, viz., an ability to throttle the systolic pulse wave. As long as this function is unimpaired, conditions in the general circulation are only in a slight degree reflected in the capillaries themselves, but any lesion of the precapillaries or their throttling function results in definite changes in the capillaries. The latter may, likewise, be the seat of either functional or organic disturbances.

The only pathognomonic variety of capillary picture is a distinct elongation of the hairpinlike capillary loops—a picture almost limited to arteriosclerosis without involvement of the renal vessels. Tortuosity of the capillaries is common in mitral defects, apparently as a compensatory condition, to improve the permeation of blood into the tissues. Unusual constriction of the arterial limb is always abnormal, and is probably due to a toxic lesion of the capillary. A continuous flow does not necessarily imply a satisfactory condition of the circulation, as it may be found in severe myocarditis and arteriosclerosis. A slow flow usually signifies reduction of central power, especially in myocarditis. A granular flow (absence of red cells for a certain distance in the vessel) seemingly always points to peripheral vascular disease. A backward flow is the result of peripheral stasis. The capillary pulse is due chiefly to loss of precapillary throttling, and little or not at all to the condition of the heart; it is not necessarily a feature of aortic insufficiency. In high blood-pressure, long, unconstricted capillaries with rapid, continuous flow point to arteriosclerosis without disease of the capillaries, whereas markedly constricted loops with a granular flow point to renal sclerosis and injury of the capillaries.

Markedly deformed capillaries were observed by L. A. Miller (Ohio State Med. Jour., Dec., 1924) in 3 neuropathic patients with histories of illness extending over many years and an unfavorable inheritance—cases exemplifying, in his opinion, Müller's vasoneurotic diathesis.

According to Redisch (Klin. Woch., Dec. 2, 1924), insulin intravenously shows by capillaroscopy a much better flow of blood through the tissues, counteracting the effects of adrenalin injections and lowering the blood-pressure.

Hisinger-Jägerskiöld (Acta med. scand., May 22, 1923) asserts that variations of the capillary circulation are determined chiefly by the amount of peripheral blood-supply, the blood distribution and the blood volume. The latter can therefore, in a measure, be estimated from the behavior of the capillaries. L. J. Henderson (Jour. Amer. Med. Assoc., Jan. 31, 1925) stresses the enormously important function of the capillaries in taking care of the very variable requirements of the tissues. Through marked variations in the size of the capillary bed, oxygen may be furnished in suitable quantities and carbon dioxide removed.

Using an improved method of measuring the capillary pressure, E. Kylin (Hygiea, Apr. 30, 1923) found the normal pressure between 80 and 200 mm. of water. It remains normal in essential hypertension, but in acute diffuse glomerulonephritis rises up to 750 mm.—a fact supporting the view that glomerulonephritis is actually a diffuse capillary disorder.

In an epileptic young woman, E. Hirsch (Med. Klin., Jan. 11, 1925) found a left-sided myosis and twisted capillaries in the left hand. These conditions both disappeared in 4 years, the epileptic attacks meanwhile becoming much less frequent.

# CARBON MONOXIDE. See GAS POISONING.

CARBON TETRACHLOR-IDE.—TOXICOLOGY.—Two fatal cases of poisoning by this drug have been reported by B. M. Phelps and C. H. Hu (Jour. Amer. Med. Assoc., Apr. 19, 1924), the 1 in a girl of 5½ years who had taken 1 c.c. of the drug and died 2 days later, and the other in a man aged 46, who had been given 50 minims (3 c.c.) of the drug in a solution containing 15 Gm. (½ ounce) of magnesium sulphate, and died in 40 hours. Necropsy in the 1st case showed marked focal necrosis in the liver, petechial hemorrhages in the kidney capsules, and various

changes in the gastrointestinal canal; the 2d case showed central necrosis of the liver, necrosis of the suprarenal cells, and slight acute gastritis. Experiments showed that the drug in sufficient dosage produces hepatic necrosis and necrosis of the adrenal cortex in guinea-pigs.

In tests in dogs, E. W. Schultz and A. Marx (Amer. Jour. of Trop. Med., Sept., 1924) found that as little as 0.05 c.c. per kilo. produced mild hepatic lesions in some animals. Simultaneous administration of magnesium sulphate decreased the toxic action on the liver, and with this precaution the usual dose of 3 c.c. for an adult human subject is probably within the limits of safety. Larger doses have been given in individual cases without serious symptoms.

According to Chopra and McVail (Indian Med. Gaz., Oct., 1923), the chief contraindication is impaired liver function, such as is caused by alcoholism. A pure specimen of the drug is to be insisted upon. S. B. Pessoa (So. Med. Jour., Sept., 1924) states that of 5 patients developing toxic symptoms after carbon tetrachloride, 4 were alcoholics and 2 showed signs of hepatic cirrhosis. Where the drug is contraindicated, oil of chenopodium may be substituted.

N. C. Davis (Jour. of Med. Res., Sept., 1924), found in dogs that high carbohydrate diets afford very striking protection against liver injury from carbon tetrachloride, while starvation is harmful, and all-fat diets are conducive to maximal injury.

THERAPEUTICS.—As noted by L. Cheinisse (Presse méd., Mar. 8, 1924), carbon tetrachloride has proven a specific in hookworm infestation, though more destructive to Necator americanus than to Ankylostoma duodenale. The optimal dose is 2 c.c. (32 minims) in the adult and 0.1 c.c. (11/2 minims) for every year of age below 15. Not over 3 c.c. in a day should be given. The 1st evidences of poisoning by it are dizziness, nausea, headache and somnolence. It is generally given in hard gelatin capsules or in water. The dose may be given at 1 time or divided into 3 or 4 amounts to be taken at hourly intervals. No food nor alcohol should be taken just before or after the drug. A purgative may or may not be required after it. Not less than 3 weeks

should elapse between successive treatments. The drug has also been used locally with success in acne, folliculitis, psoriasis and seborrheic eczema.

CARBUNCLE. - As general measures in the treatment of carbuncle, H. E. Griffiths (Lancet, Jan. 3, 1925), aside from the control of any existing constitutional disease, recommends light but nutritious feedings every 2 hours, with eggs and milk as staple foods; an initial blood transfusion where the patient's resistance is much lowered; an initial saline purge and a daily dose of salts sufficient to keep the bowels open; where there is evidence of intestinal decomposition, calomel, 1/4 grain (0.015 Gm.) hourly up to 1 grain (0.06 Gm.), for 3 days; lemonade, barley water or imperial drink up to 1 gallon (4 liters) a day, and, if practicable, a warm bath once or twice a day, or, failing this, a blanket bath. Sleep is essential, morphine being given if necessary. Small doses of autogenous vaccine sometimes benefit in the later and chronic stages.

Locally, rest of the part is important, a splint being used in involvement of an extremity. A wide area should be shaved and cleansed with soap and water or ether, and large fomentations of boric lint applied, covered with jaconet and a thick layer of cotton, and changed every 1/2 hour when the location of the lesion permits. Operative treatment, when adopted, should be looked upon as an emergency procedure, a delay of 24 hours or more for "preparation" entailing much unnecessary suffering and intoxication. A general anesthetic should be used. The operative method of choice is usually the free crucial incision, with removal of all necrotic tissue with sharp scissors. Oozing is controlled by packing tightly for 2 minutes with gauze wrung out in hot saline, or, if required, by touching the bleeding points with the actual cautery. The wound is then packed with gauze soaked in concentrated magnesium sulphate solution. The dressing is changed in 24 hours, and thereafter usually twice a day. An alternative to the magnesium sulphate dressing is bipp, taken on gauze and rubbed firmly into the walls of the wound. excess sponged away, and the cavity packed lightly with gauze; this may remain for 2 or 3 days and then be renewed under gas. The wellknown phenol treatment is disadvantageous in that separation of the sloughs and healing are slow, and there may be risk of carbolic poison-

All first dressings should be under gas anesthesia. The gauze is soaked before removal and the wound irrigated with saline solution or 4-volume hydrogen peroxide solution. In repacking, the edges should be packed well open. The surrounding skin should be well cleaned with ether at each dressing. Any persistent carbuncle formation in the edge should be excised. The covering of a large surface is greatly hastened by the Thiersch graft or by secondary suture.

Twenty-eight cases were successfully treated with a magnesium sulphate paste by A. E. Morison (Brit. Med. Jour., Apr. 19, 1924), without any deaths. Eleven ounces of carbolized or pure glycerin are placed in a hot mortar, 1½ pounds of dried magnesium sulphate added, and

the whole slowly stirred and mixed with a warm pestle. The resulting white cream is hygroscopic and liquefies on exposure to the air. paste is spread thickly on a piece of sterile white lint large enough for the entire inflamed area, and is well covered with jaconet and cotton. A profuse discharge of serum follows, and the dressing is renewed in 12 to 24 hours. In a few days the central slough separates and a raw granulating surface is left, which is dressed with the paste until all signs of sphacelating cellular tissue have disappeared and a healthy granulating surface is seen. The cavity is then packed daily and the undermined edges supported with strips of sterile lint about 11/2 inches wide, wrung loosely out of a saturated magnesium sulphate solution made by dissolving 40 ounces of the sulphate in 30 ounces of boiling water and 10 ounces of glycerin and sterilizing in an autoclave. The whole area is then covered with a double layer of lint saturated with the solution, over which a piece of jaconet and then cotton are placed and fixed loosely with a bandage. This dressing is renewed daily until the healthy, firm granulation tissue is level with the surrounding skin margins. It can then be covered with Thiersch grafts or be allowed to epithelialize from the edges.

In small carbuncles or furuncles, H. Hans (Münch. med. Woch., Nov. 28, 1924) applies pure liquefied phenol to a small area over the center of the lesion once or twice a day, follows with tincture of iodine, and then covers the area with a simple ointment. When the lesion has opened, dressings of glycerin and alcohol are substituted for the oint-

ment. Hot compresses are used as the external covering. Under this treatment the process ruptures outward quickly and the breaking down within is arrested. Small carbuncles are checked in a day or 2, the discharge becomes watery in 4 to 6 days, and a small, inconspicuous, soft scar results. In evacuating larger carbuncles with the knife, the writer endeavors to save as much as possible of the skin, to reduce scarring, but uses strong phenol within the cavity. Injections of the patient's own blood around the lesion, as advocated by Laewen, are also availed of in severe cases.

In an extending carbuncle of the neck in a diabetic, A. Harf (Deut. med. Woch., July 11, 1924) injected 20 c.c. (5 fluidrams) of diphtheria antitoxin into and beneath the skin above the lesion down to the cranium and at the sides of the lesion down to the cervical fascia, with the result that extension ceased soon after. Bockenheimer's method of daily freezing of the board-like infiltration with ethyl chloride, to soften it, was employed in addition.

Canon (Ibid., July 18, 1924) resorted chiefly to immediate immobilization in 18 cases of carbuncle as well as 110 of furuncle. The patient stays in bed, elevation of the involved area is utilized when indicated, and dressings of dilute aluminum acetate solution are applied. In this procedure, incision is shunned on the ground that the attendant risk of blood infection is too great. If the patient is unwilling to remain at absolute rest from the start, however, incision is employed, with as much immobilization as can be obtained.

Carbuncles of the hand may develop, according to J. H. Garlock (Surg.,

Gyn. and Obst., Aug., 1924), on any part of the dorsum that contains hair follicles. Of 38 cases, 19 occurred on the dorsum of the hand proper, 16 on the dorsal aspect of the proximal phalanges, and 3 on the middle phalanges. Differentiation from simple abscess is possible in most cases in that in carbuncle one can almost always demonstrate 1 or more sinuses discharging pus in the area surrounding the region of central necrosis, and in that induration is more marked and extensive. Nine cases had received inadequate primary incisions. A crucial incision, extending to the outside limit of the induration, should always control the infection. Packing the wound with gauze lifts the flaps and controls the venous ooze.

No skin should be cut away unless it is grossly sloughing. Small skin grafts may hasten recovery.

> According to F. M. Hodges (Amer. Jour. of Roentgenol., May, 1924), every carbuncle should have X-ray treatment as soon as the diagnosis is made. Treating 9 extensive carbuncles in this way, he observed almost complete relief from pain in 6 to 24 hours. The technic comprised: 4 ma.; 9-in. spark-gap; 8 minutes; 9 mm. aluminum; 9 inches' distance. Half this dose was repeated about the 4th day when necessary. In 5 cases the lesion changed rapidly, usually in 2 days, into a fairly large central abscess which drained freely for 2 or 3 days and then healed promptly. When softening 1st occurs a small incision should be made. The infection is usually limited by the treatment and the duration of the disease shortened. Surrounding lymphangitis usually disappears in a few hours. Good results were also obtained in 2 cases of stone bruises and in 1 case of palmar abscess, as well as in 1 case of ischiorectal abscess.

**CARDIOSPASM.**—A distinction is made by J. Friedenwald and T. H. Morrison (South. Med. Jour., May, 1923) between spasm at the cardia, as a transient contraction, and cardiospasm, in which, in addition to hypertrophy or unusual, strong contraction at the cardia, there is a diffuse dilatation of the esophagus. The former is more likely to be found in neurotics, and the latter, in persons leading an active physical life. The diagnosis of cardiospasm is based on a history of substernal distress, choking, attacks of regurgitation, some difficulty in swallowing, and absence of the 2d swallowing sound. A stomach tube passed into the esophagus will reveal retained food material, and if a bougie or sound is passed unguided it is apt to impinge upon part of the dilated esophageal wall.

Two cases are reported by Zaaijer (Ann. of Surg., May, 1923), illustrating the fact that cardiospasm sometimes occurs in old people, though most commonly seen in the young or middleaged. A mistake may be made in immediately considering cases with complaints of this type as cancerous. His cases were 58 and 65 years of age, and both the X-ray and esophagoscope were used in making the diagnosis. One patient was cured and the other improved in 6 months.

Two classes of cases are recognized by P. P. Vinson (Jour. Amer. Med. Assoc., Mar. 15, 1924): Group 1, with a slight sense of obstruction at the cardia to the passage of food, with or without pain, but with no X-ray evidence of obstruction to the passage of a thick barium acacia mixture, and Group 2, in which the symptoms may be quite as mild as in the 1st group—though usually

much more pronounced,—but there is definite obstruction to the barium meal. Patients in Group 1 are prone to psychoneurotic tendencies, and though some may require forcible dilation for relief, many are relieved by antispasmodic drugs. Patients in Group 2 are not, as a rule, psychoneurotic, and medical measures are of little value.

Among 415 cases in Group 2 observed at the Mayo Clinic, the age ranged from 5 to 83 years, but almost  $\frac{1}{3}$  were in the 3d decade of life. There were 246 males and 169 females. The duration of symptoms averaged 7 years. The onset was sudden in 67. Epigastric pain existed in 197, and in a considerable number had antedated the dysphagia by several months. The diagnosis of cardiospasm is made on the typical X-ray findings and history of dysphagia of long duration, without progression, in patients who have had as much difficulty in swallowing liquids as solid food, and in whom a 45 French olive can be guided without obstruction on a previously swallowed silk thread. The conditions to be differentiated are carcinoma at the cardia, diverticulum of the lower end of the esophagus, gastric herniation through the diaphragm, diverticulum of the cardiac end of the stomach, angina pectoris and gallstone colic.

In the treatment, occasionally a patient is relieved by large doses of tincture of belladonna or atropine sulphate, but only temporarily. Passage of sounds, stomach tubes or bougies is rarely beneficial. Dilation with a bag distended by water-pressure is the measure of choice. Where the esophagus is not widely dilated

the pressure should be 16 to 22 feet of water; otherwise, 24 to 28 feet is reasonably safe. The dilator is guided into the cardia on a previously swallowed silk thread, and the water pressure is gradually increased to the desired level and maintained there for a few moments. stretching is usually painful, but no anesthesia is used. Use of the X-ray to control the dilation proved unnecessary. The results are excellent, though recurrence occurs in about 25 per cent., usually within 6 months. The majority of cases obtain complete relief if the treatments are repeated. Dilation should be regarded distinctly as a surgical procedure, 4 deaths having followed it.

J. Oehler (Münch. med. Woch., Oct. 20, 1922) employs merely a flexible stomach tube in treating cardiospasm. The tube is held against the cardia until it overcomes the resistance. The patient is instructed in its use, and improves rapidly as a result, partly on account of the marked psychic element existing in rather many of the cases.

In a case recorded by S. H. Watts (Ann. of Surg., Aug., 1923), a cardio-plasty, analogous to Finney's pyloro-plasty, was carried out. An old gastrostomy opening from a previous operation was closed and a new Frank gastrostomy made. Fourteen months later the patient was well and had no trouble in swallowing any kind of food.

CAROTID ARTERY.—AN-EURISM.—A case of bilateral aneurism of the common carotids, with cure by operation, is reported by H. H. Kruizinga (Ned. Tijd. v. Gen., Dec. 22, 1923). The aneurism on the right side preceded the other, and was dealt with by division of the common carotid between 2 ligatures. Vomiting, headache and dizziness were later complained of, and 16 weeks after the 1st operation he returned with an aneurism of the left common carotid, threatening to rupture. This was successfully treated like the earlier lesion. The cause of the aneurisms was not definitely ascertained; the patient was malarial, and his dizziness and headache yielded to quinine. He was shown not to be syphilitic.

From studies of the circle of Willis in 100 cadavers, F. Walker (Arch. f. klin. Chir., Sept. 15, 1924) concluded that ligation of the common or internal carotid is less dangerous in mesocephalic and brachycephalic individuals than in dolichocephalics, on account of differences in the incidence of communicating arteries of the circle of Willis in these several types. Brain complications result more commonly in adults than in children, on account of the greater tortuosity of and greater resistance by the superficial brain arteries in the former. A large internal jugular vein favors severe circulatory disturbance after the operation, and should be ligated along with the artery.

### CATARACT, —ETIOLOGY.—

Among the factors apparently having to do with the production of cataract are diabetes, chronic nephritis with hypertension and arteriosclerosis, thyroid disease, acute infections and dental caries. The fact is pointed out by H. Baldwin and E. A. S. Barthel (Jour. Amer. Med. Assoc., Sept. 27, 1924) that all these conditions have a common feature in showing a tendency to hyperglycemia. Of 132 consecutive cases of cataract, they found 99 with a blood sugar percentage above 0.12. When diabetics with cataract are placed on a

rigid antidiabetic diet, the cataracts have been noted as being retarded in development, arrested or, in a few cases, as having partly cleared. Possibly in cataract of other origin associated with hyperglycemia, the condition might likewise be retarded by diet or other measures to reduce the blood sugar.

M. H. Langdon (Ibid.) notes that Burge found experimentally that lenses charged with sugar and exposed to light became opaque, while others without the sugar were not so affected. In his own studies on blood chemistry in cataract cases, only abnormalities in reference to the sugar were found, the urea nitrogen and creatinin being normal in all cases except 1. In 100 cases, however, the blood sugar was above the upper normal level only in 17 per cent. Nevertheless, a relationship of blood sugar to cataract was suggested by the fact that in 4 cases reduction of the blood sugar to normal by treatment was followed by complete arrest of the lens changes for 3 years, and in 1 case there was improvement in the lenticular condition.

A case of diabetic cataract in a child is reported by S. Strouse and H. Gradle (Ibid., Feb. 16, 1924). Such cases are rare, death usually taking place before cataract can develop. The patient was a girl of 10 years, in whom cataract was 1st noticed 13 months after her initial admission to a hospital on account of diabetic symptoms. A rapidly progressive type of cataract was observed. The right lens was swollen and more or less uniformly opaque; the left showed incipient peripheral striæ. A discission of the right lens was performed and ethylmorphine hydrochloride (dionin) used at intervals. Later observation showed a perfect result. Under insulin and diet the patient remained in good general condition.

**DIAGNOSIS.**—T. H. Butler (Brit. Med. Jour., Oct. 25, 1924) lays stress

on the help afforded by the slit lamp, which furnishes an accurate knowledge of the nature of a cataract and allows of detection of the earliest signs of inflammation both before and after operation. He would be unwilling, moreover, to operate on a cataract without having made a minute examination with the Czapski microscope. He refused to extract a lens that he would have operated on had the slit lamp not forewarned him of a chronic cyclitis. By these minute examinations it is often possible to decide at what period of life an opacity originated.

TREATMENT.—Mercury cyanide subconjunctival injections were employed by J. H. Burleson (South. Med. Jour., June, 1923) in 50 cases of lenticular opacities, of which about 34 were senile cataracts and the remainder occurred in young adults or children. In all cases vision was improved. When the opacities could be traced to a definite infection, permanent improvement resulted. Cases that relapsed all belonged to the senile group. progress is to be expected from the injections when the vision is below  $\frac{20}{70}$  before treatment. The patient is put to bed the day before an injection. For anesthetic purposes a few drops of 10 per cent, cocaine solution are instilled at intervals of 2 or 3 minutes. Next, a 1 per cent. solution of cocaine is injected under the conjunctiva. Three minutes later, 20 c.c. of 1:3000 mercury cyanide solution are injected deep under the external rectus; little or no pain results. The eyelids are then covered with vaselin, a protective dressing applied, and the eyes kept closed for 2 days. A general

edema of the orbital cavity follows the injection, which is repeated 3 times at intervals of 3 weeks.

A similar medical treatment has been used for several years in incipient senile cataract by S. P. MacEnri (Lancet, June 7, 1924), with apparently permanent good results. When the patient can come regularly for treatment, he gives the subconjunctival injections of mercury cyanide, 1:5000, with 4 per cent. sodium chloride solution, once weekly for about 3 months. If the patient lives at a distance he prescribes a collyrium of potassium iodide and sodium iodide, of each 2½ drams (10 Gm.) to 1 pint (500 c.c.) of water, to be used for 5 minutes twice daily. Iodine vasogen is also to be rubbed round the eyes at bedtime. In a typical illustrative case in a woman aged 50, whose left eye had been failing for a year, improvement of vision from \%12 to \%6 took place in 4 months and was still maintained nearly 6 years later. Results are more striking with the injections than with the iodides.

According to J. W. Sanders (Ill. Med. Jour., Jan., 1925), 60 per cent. of incipient acquired cataracts can be held in check, improved or cleared up entirely by early, suitable treatment. An attempt should be made to correct systemic troubles such as intestinal toxemia, Bright's disease and diabetes, and local troubles such as refractive errors, conditions of light, heat, etc. He also uses potassium iodide and syrup of hydriodic acid internally. Locally, potassium and sodium iodides in 1 and 2 per cent. solution used as eye baths twice a day for several minutes have been beneficial. Calcium iodide in solution or ointment has also given good results. With these he uses dionin ointment or powder twice a week at night. Often where there is excess of uric acid or a rheumatic condition, in addition to an attempt to correct the systemic trouble and remove focal infection, together with the iodides internally and locally, he uses a solution of sodium salicylate locally and gives 60 grains (4 Gm.) of sodium salicylate internally twice a week.

Operative Treatment.—A number of methods of cataract extraction have been devised and met with varying favor, but, according to C. B. Meding (Cincinnati Med. Jour., v, 177, 1924), the method used has little relation to the end-results because of: (1) The wide range in the skill of operators; (2) the great variation in the physical, mental and racial characteristics of patients, and (3) the relation of the operative method to the experience of the operator. The writer prefers an intracapsular extraction in which the ligament is ruptured from within with modified Kalt forceps with 2 small balls on their tips. These forceps are introduced closed. The position of the balls can be determined from the bulge of the iris. With the forceps grasping the globe, pressure is made to bring the ligament forward, and the forceps are then opened and closed to rub the zonula from about 4 to 8 o'clock. If the lens is dislocated, the operation is finished by the Smith method; if not, the forceps are used again. This procedure is advantageous in that no harm is produced if it fails and the iridectomy follows the dislocation.

Considerable attention has been

paid of late to the Barraquer intracapsular method of cataract extraction, or phakoeresis. As related by L. Mills (Amer. Jour. of Ophth., Nov., 1923), the operation was the direct result of watching a leech at work; Barraquer induced a leech to attach itself to a lens and effected a successful extraction by drawing out the leech. Phakoeresis presents no insurmountable difficulties, but may be practiced 1st on eyes of cadavers hardened in formaldehyde, and then attempted at the start only in cases that are good operative risks. incision used causes the least amount of deformity and pressure, the knife being inserted at right angles to the sclera and turned parallel with the iris only after its tip has entered the anterior chamber. A small tongue of sclera is formed. The smallest possible peripheral iridectomy is then made, and a through-and-through suture of fine black silk is passed through both sides of the wound, but not tied. Barraquer's eresiphake or pneumatic suction vibratory device is then inserted, and held almost vertically at 1st, to bring its opening into accurate contact with the lens. Vacuum contact is next made by a gentle squeeze of a valve, without any pressure on the lens. The lens is then rotated with the instrument until its lower border is above and its anterior face has been turned posterior. The lower border is rotated gently forward into the pupil, the back of the cup looking 1st forward, then up, and then gradually blocking the pupil as the lens rotation is complete. The lens is thus rotated out through the pupillary opening. Barraquer claims that in uncomplicated cases of vacuum extraction the vitreous practically never herniates through the pupil. Glaucoma and retinal detachment never occur after the operation, correctly performed.

> F. C. Parker (Atlantic Med. Jour., Mar., 1924) reports 14 cases of vacuum extraction performed with a modification of Barraquer's apparatus, consisting of a barrel comparable to that of a medium-sized hypodermic syringe, prolonged into a narrow metal tube with a shallow cup at its distal end. Within the barrel is a freely moving plunger. Upon creating a vacuum in the upper section of the barrel by suction with the mouth through an attached rubber tube, or by employing a pump, the plunger is drawn away from the distal end of the barrel, creating therein a 2d vacuum which acts upon the lens capsule through the cup. By adjustment of a stop so that the plunger can move up but 5 to 8 mm., the vacuum suffices to withdraw the lens but it is made impossible accidentally to withdraw more than 1 or 2 drops of vitreous, however great a degree of vacuum be present. This is in marked contrast with an open tube instrument, by which the whole contents of the globe could be withdrawn at 1 pull. The writer does not believe the vibratory motion of the Barraquer procedure necessary for the dislocation of the lens. No sutures are used. The writer does not consider the vacuum method, nor any other intracapsular procedure, justifiable as a general substitute for the ordinary combined extraction.

> As noted by A. G. Biddle (Med. Jour. and Rec., Nov. 5, 1924), Green and Green, of San Francisco, have ingeniously combined the Smith and Barraquer methods, using a slight amount of traction, together with a slight amount of pressure, and thereby made the intracapsular operation a success. They have also greatly improved the instruments used and the technic, so that the percentage of vitreous loss has been reduced to a minimum. It is no longer necessary

for a patient to wait for years, halfblind, for ripening to take place; immature cataracts present no barrier to the suction method.

Various procedures facilitating cataract extraction and increasing its safety have been emphasized of late. According to G. S. Derby (Jour. Amer. Med. Assoc., Dec. 22, 1923), preparatory paralysis of the orbicularis constitutes 1 of the greatest technical advances of recent times. He uses it as a routine. The injection is made slightly posterior to the point at which the vertical tangent of the external wall of the orbit meets the horizontal tangent of the lower orbital margin. The needle is introduced along the lower orbital margin close to the bone, so as to reach nasally to the line of the inner canthus; it is then withdrawn and introduced upward along the external margin of the orbit until the injection reaches the level of the upper margin of the orbital wall. cubic centimeters (32 minims) of 2 per cent. procaine, with a little epinephrin, are sufficient—1 c.c. for each injection. The operation is begun in 7 or 8 minutes.

As perfect anesthesia of the eye itself will eliminate many complications, Derby uses 1 or 2 drops of 10 per cent. cocaine solution, in addition to the 3 or 4 drops of 4 per cent. solution, over a period of 10 minutes or more. In restless, fearful patients, those with congested eyes, in glaucoma, intraocular foreign bodies, etc., when general anesthesia is not to be used, the orbit is injected from the outer or inner canthus (through the already cocainized conjunctiva) with 1 or 2 c.c. of 2 per cent. procaine and epinephrin solution.

To prevent opening of the wound and prolapse in the 48 hours after operation, or even later, the writer believes suture of the wound indispensable in certain cases. A very small flap of conjunctiva, dissected at the upper limbus, is employed in the process. To avoid interference with the corneal section, the suture is not completed until after this section has been made.

For some years L. C. Peter (Atlantic Med. Jour., May, 1923) has been employing narco-anesthesia in cataract extraction. Sodium bromide, 15 grains (1 Gm.), and chloral hydrate, 10 grains (0.6 Gm.), are given 2 hours and 1 hour before operation, and also morphine 1/6 grain (0.01 Gm.), and atropine, 1/150 grain (0.0004 Gm.), hypodermically, 1/2 hour beforehand. As to the lid anesthesia, Barraquer's method is used, with good results. Two c.c. of 11/2 per cent. procaine solution are injected under the skin to the outer corner of the eye, the needle being directed 1st upward, then downward, and finally across the base of the lower lid. The patient rarely knows when the operation begins or

As the eyes rarely work together where 1 cataract has been extracted, and the diplopia proves very annoying, C. G. Fellows (Jour. of Ophth., Otol. and Laryng., May, 1923) advises refusal of operation in patients who have 1 useful eye. Otherwise, often an opaque blinder over the operated eye proves necessary. To settle the patient's fears, he should be told that he can be operated on at any time with the prospect of a successful result; he is to continue using his good eye at least until cataract is imminent in it.

CATATONIA.—A striking feature of catatonia, as pointed out by

H. Claude (Paris méd., Oct. 18, 1924), is the inability of the will to regulate, moderate and stop psychomotor action, however initiated. The cause of these disturbances in the mechanism regulating the psychomotor associations seems to lie in a lesion of the basal gray nuclei, and particularly in the corpus striatum. In several recent studies of catatonic dementia, lesions in the central gray nuclei, notably the pallidum, were found. Attention has been called to the motor syndrome analogous to Parkinsonism which may be observed in catatonic dementia, viz., forward flexion of the body, arms glued to the sides, forearms flexed, muscular hypertonicity, sympathetic phenomena, etc. According to d'Hollander, the lesion in catatonia should be sought in disturbed relations of the cortical motor sphere with the extrapyramidal centers, either by obstruction of the afferent paths or by inhibitory effects which deprive the corticopyramidal system of the voluntary stimuli calculated to bring it into action; hence the inertia.

The regulating centers are not always injured or destroyed by morbid processes; there is reason to believe that they may be the seat of circulatory disturbances or of toxic or infectious changes that are transitory, or of reflex inhibitory phenomena which disturb their function only temporarily. Hence the intermissions and remissions not rarely noted in catatonic states, even in dementia præcox. In cases of post-encephalitic hebephreno-catatonic syndromes observed by the writer, and which, seen several years later, had completely recovered, the catatonic manifestations had receded previous to

the disappearance of the general signs of encephalitis.

One case seen was remarkable in the coexistence of a cataleptoid attitude on 1 side of the body and of Parkinsonian stiffness on the other, with palilalia, echolalia, echopraxia, and word intoxication, in the absence of lesion of the pyramidal tract and without pronounced intellectual defect, but with paroxysmal weeping, fits of anger and impulsiveness. In this patient, whereas the Parkinsonian rigidity shows little change, the catatonic phenomena, echolalia and palilalia undergo marked variations from day to day. The writer has also seen complete recoveries of several years' standing from typical catatonia referred by all psychiatrists who examined the patients to dementia præcox. Catatonia in melancholia often disappears upon improvement of the melancholic state.

In the catatonia of general paralysis, lesions of the central gray nuclei are frequent, as the author observed in examining 18 brains from such cases; but no relation seemed to exist between the severity of the lesions and the symptoms of cata-This suggests that certain factors in explanation of the syndrome are as yet unknown. uremic or nephritic catatonia, the condition can probably be definitely ascribed to a pallidal lesion. Distention of the cerebral ventricles can, apparently, in some instances induce catatonic manifestations; this applies to hydrocephalus, brain abscess with hypertension, and meningeal hemorrhage. In the horse and ox there occurs, according to Besnoit, a condition exactly like catatonia; post mortem, lesions of tuberculous encephalitis and distention of the ventricles have been found.

CECUM.—According to I. S. Hirsch (Med. Jour. and Rec., June 4, 1924), there is much evidence of the existence of sphincteric activity at such a level of the caput coli as will divide it in 2 parts, vis., the cecum below, and the cecal colon above. The retinacular bands at this level, supposed to be vestigial strips, may actually functionate and by spasm partly or completely shut off the 2 parts of the caput coli. The cecocolic sphincteric portion of the colon shows an active repulsion of the intestinal contents until cecal digestion and absorption are complete. this level there is undoubtedly a regulation by chemical changes, as with the opening and closing of the py-Spasm of the cecocolic sphincter leads to cecal distention and stasis, this, in turn, initiating inflammation and ulceration. Appendectomy does not always remove the cause of the spastic condition; the latter may be demonstrated in cases in which symptoms reappear after this operation.

PROLAPSE.—Angus McLean (Jour. Mich. State Med. Soc., Dec., 1923) states that when, in chronic appendicitis with an elongated cecum, only appendectomy is done, and no attempt made to elevate the cecum onto the pelvic brim, the preëxisting symptoms persist after the operation. Where a long cecum is found in operating on some other condition, he advises shortening of the cecum by the following method, found satisfactory in over 300 cases: The ascending colon is 1st pulled down and the highest discernible portion

of the 3 longitudinal muscular bands of the bowel brought into the opening. A small needle is passed transversely through these fibres and a continuous stitch of 3 bites taken, about \( \frac{1}{3} \) inch apart. In tying the suture the band is puckered up. In each band 3 or 4 such sutures are placed. Similar stitches are inserted in the peritoneum along the margin of the mesocolon, puckering up the peritoneum, and on the peritoneum on the outer sides of the ascending colon and cecum. Through subsequent formation of adhesions and encystment of the sutures, a permanent shortening results.

> The chief symptoms in cases of dilated, elongated and prolapsed cecum are given by I. S. Haynes (Amer. Jour. of Surg., Oct., 1924) as indigestion, gaseous accumulation, and constipation, with irregular attacks of pain and tenderness in the lower right quadrant and a "drag" in the right flank. In 22 such cases he proceeded as follows: Any bands or veils distinctly constricting the gut were severed, usually after ligation only at their origin from the outer parietes. The cecum was then narrowed and shortened by suture of the inner and the anterior bands together with a continuous linen stitch, care being taken not to leave any abrupt bulge or pocket. The after-treatment includes diet, mild laxatives, exercise, and supporting belts in cases with enteroptosis. Thirteen of the 22 cases later reported as cured, 5 did not return, while in 4 cure of the original condition occurred but other disturbances were complained of.

TUMORS.—Among 100 specimens of cancer of the cecum removed at operation, W. McK. Craig and W. C. MacCarty (Ann. of Surg., June, 1923) found 32 with and 68 without metastases in the regional lymph glands. The size of the intestinal

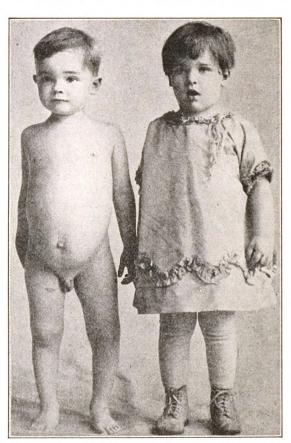
lesion and the size and number of the regional nodes was found to be no criterion of the presence or absence of metastasis. Predominance of involvement of the posterior ileocolic lymph glands should be significant in the operating room, since 71 per cent. of all glands were found in this region, and 64 per cent. of the glands with metastases belong to this group.

A case of intussuscepted ileocecal cancer mistaken for ovarian cyst is reported by H. Pollack (Münch. med. Woch., July 11, 1924). Insufficient attention had been paid to the blood in the stools. On the day before operation a considerable hemorrhage, with tenesmus and collapse, occurred. After the intussusception, forming a mass of the size of a child's head, had been corrected, the entire ileocecal region was found involved in an adenocarcinoma. Recovery followed resection, lateral anastomosis and removal of the regional lymph-nodes.

VOLVULUS.—In 69 operative cases of volvulus of the cecum, H. Beeger (Deut. Zeit. f. Chir., Mar. 30, 1923) found the volvulus had been complete in 42 per cent. A fatal ending occurred in over 53 per cent., 26 patients dying in collapse and 9 from peritonitis. Of 206 cases collected by E. Öhman (Finska läk. handl., July-Aug., 1924), 41 were not operated, and all died. In the 165 operated cases the mortality was 45.8 per cent. In the writer's hospital there were many cases of it during the war years, suggesting that food shortage and the substitution of bulky foods of low nutritive value promoted the disorder. It was commonest in young and middle-aged adults, and the great majority of cases were in males. Repeated painful attacks had preceded the volvulus in 16 instances.

**CELIAC DISEASE.**—TREAT-MENT.—The consensus of opinion is that this disturbance of nutrition of late infancy and early childhood—frequently termed *chronic intestinal indigestion*—is a functional disease characterized by inability properly to

be given. The best substitute is protein (albumin) milk. Lactic acid milk may be used in some cases. Dry milk, especially if prepared with a fat-free milk, is sometimes tolerated, as is likewise unsweetened or rarely sweetened condensed milk.



Celiac disease. R. V., aged 7; weight, 39 pounds; hemoglobin, 50 per cent.; with his sister (normal), aged 3½. (Sauer, in Amer. Jour. Dis. of Childr.)

utilize carbohydrates and fats. S. V. Haas (Amer. Jour. Dis. of Childr., Oct., 1924) strongly recommends the following treatment: Castor oil, 15 Gm. (½ ounce) once weekly. Daily colon irrigation with as many liters of sodium bicarbonate solution (15 Gm. to the liter—quart—of warm water) as may be necessary to obtain a clear return. Plain milk should not

Pot cheese is useful, and broths and the white of eggs may be given. Gelatin, when accepted, seems especially desired. After improvement has set in, meat is often well borne. Saccharin should be used for all sweetening, and all carbohydrates other than those contained in the above-mentioned articles be avoided, with 1 exception, viz., sucrose as it

occurs in the extremely ripe banana. This is tolerated perfectly, and rapidly changes the entire picture of the disease. The bananas offered may be quickly increased by 1 or 2 daily until the patient's demand for carbohydrate is satisfied. Even banana may be refused at 1st, only protein milk being acceptable, but sooner or later the banana is relished, and should then be increased to the maximum the child will take-usually 4 to 8 daily (in 1 case, 16). Fats are exceedingly harmful, except as they occur in protein milk and pot cheese. Upon improvement, butter is often successfully taken. Vegetables may be added early, but carefully. The caloric requirement is at 1st 2 or 3 times the normal. Treatment, to be successful, should be continued for an indefinite period; in severe cases the 1st 4 or 6 weeks are apt to be discouraging. Of 10 cases reported, 8 were clinically cured by the treatment described, while 2 untreated cases died.

> Good results in 6 cases are reported by L. W. Sauer (Ibid., Feb., 1925) with powdered protein milk as the essential diet for many months. He describes a simple 3-phased high protein diet which can be used readily in the home. The initial 24-hour diet consists of several level tablespoonfuls of protein milk less than the number of pounds of weight. This is mixed with about 1 quart of warm sterilized water, and may be sweetened with 1/4 to 1 grain (0.015 to 0.06 Gm.) of saccharin. It is passed several times through a fine sieve, divided into 4 parts, and placed in the refrigerator until used-in 4 meals. If anorexia is extreme, a pinch of fat-free cocoa may be boiled in the water. The milk powder is increased about 2 tablespoonfuls every 5 or 7 days, until the number approximates the theoretic

weight of the child for his height. In pronounced emaciation, persistent diarrhea, or tetany, Ringer's solution should replace the water. Anemia improves under iron citrate, 1 or more grains intramuscularly 2 or more times weekly for a month. Precipitated chalk, 10 grains (0.6 Gm.) added to each feeding, lessens intestinal fermentation and distention. This 1st phase is adhered to until the stools, distention and appetite distinctly improve—usually in 3 or 4 weeks. In the 2d phase the protein milk is supplemented with almost pure protein foods, such as curds of buttermilk or of machine-skimmed milk, scraped lean beef, tongue and egg, increased gradually. Codliver oil, orange juice, powdered spinach and syrup of ferrous iodide may be gradually included. This phase continues until the theoretic weight for the height is approximated or exceeded. In the 3d phase, which should never begin earlier than after 6 weeks, carbohydrates-at 1st dextrinized flours (patent barley flour, flour ball or imperial granum)also arrowroot crackers, finely rolled zwieback or toasted white bread are cautiously added. Fresh cow's milk, cream, butter and meat fat must be omitted for many months; if exacerbations occur, they should be omitted for years.

#### CEREBELLUM.—ABSCESS.—A

large compilation of operated cases of cerebellar abscess of otitic origin gave, according to W. P. Eagleton (Surg., Gyn. and Obst., Nov., 1924), but 10.5 per cent. of recoveries, though some observers reported as high as 50 or 60 per cent. Analysis of the postmortem records of 131 cases showed, however, that 81 per cent. of such cases should theoretically be amenable to surgical treatment. A large majority of cerebellar abscesses of aural origin are situated in the vicinity of the seat of primary infection in the labyrinth or of the

thrombosed lateral sinus. Present knowledge of cerebellar localization is so rudimentary that the surgeon can make only a tentative preoperative diagnosis of the abscess as being located either (1) in the surgical anterior cerebellar triangle, or (2) in the posterior  $\frac{2}{3}$  of the posterior fossa. In many cases a decision between these 2 positions can be made by study of the history and a complete neurologic examination with functional tests of the static and auditory labyrinths and blood and cerebrospinal fluid examinations. Generally, when the labyrinth is the tract of infection, the abscess is in the anterior surgical triangle, while if the abscess originates from sinus thrombosis, it is in the cerebellar hemispheres or on 1 of the cerebellar surfaces. The presence of a dead labyrinth with unmistakable symptoms of brain abscess is presumptive evidence of suppuration in the cerebellum.

In surgical exploration for abscess in the anterior surgical triangle, after destruction of the labyrinth, Eagleton advocates a procedure calculated to overcome the difficulties of Bourguet's method of double ligation of the lateral sinus, while keeping within an area as yet uninfected. He begins by uncovering the dura over both cerebellar hemispheres, and next exposes the lateral sinus on the affected side. A clean area is obtained by approaching the sinus from behind, after which the sinus is obliterated by inversion of its outer wall into its cavity, just below the knee, and by an encircling ligature in its lower portion. This procedure admits of a free incision of the dura through the walls of the sinus, with enlargement anteriorly or posteriorly into the contiguous dural surface-often in an uninfected area.

TUMORS.—Headache, projectile vomiting and choked disk are cardinal manifestations of cerebellar

tumor, and of these, the vomiting is commonly the earliest. At times, however, as stated by P. K. Menzies (N. Y. Med. Jour., Oct. 3, 1923), the earlier symptoms may be due to interference with cerebellar function, beginning with an ataxic stumbling gait and general muscular weakness, especially in the lower limbs. Strabismus and nystagmus may occur early, with facial weakness on the same side as the lesion. Later, the patient tends to fall backward, or to 1 side, and may even fall over when sitting. Sudden vertigo is not uncommon, and may go on to unconsciousness. Cerebellar seizures occur, with sudden, short, forced movements, irregular and tonic in character, as opposed to the clonic movements in cerebral irritation. There is often faulty coördination, especially in locomotion. Jerky movements of the hands are frequent, and cerebellar catalepsy may occur, and there is almost invariably a disturbance of the labyrinthine reactions. As the disease progresses, the intracranial pressure increases.

In tumor of the lateral lobe, one expects diminished or lost reflexes on the side of the tumor and a tendency to fall to that side. The nystagmus tends to be slower and of greater amplitude on looking toward the side with the lesion, finer and more rapid on looking away from it. If the tumor is in the vermis, there is greater loss of equilibrium, with a tendency to fall forward or backward rather than to the side.

Surgical treatment offers the best chance in these cases, and has sometimes yielded brilliant results, even when it was necessary to remove all of 1 cerebellar lobe. The best ap-

proach is through the crossbow incision. The prominent boss on 1 side of the occipital bone is opened with the trephine or drill, the opening enlarged with a rongeur, and if the tumor is apparent, the meninges incised and the mass removed if possible. Removal of a portion of it has been known to result in atrophy of the remainder. A non-apparent tumor may be revealed by palpation or the trocar and cannula. If the tumor is not found or is not removable, a decompression should be performed, which may save the patient's sight, lessen the symptoms, and allow of more accurate localization and a later operation.

The arm tonus test of Wodak and Fischer is regarded as useful by K. Hellmann (Klin. Woch., July 15, 1924) in the diagnosis of cerebellar tumors. The fact that vestibular stimuli produce a change in the sensation of gravity on 1 side accounts for the lowering of 1 of the patient's arms when these are extended horizontally forward in the test. The test should be kept up as long as possible or, if necessary, be repeated with short intervals of rest.

## CEREBRAL HEMORRHAGE.

—The apoplectic attack may, as pointed out by G. Riddoch (Lancet, July 12, 1924), consist of little more than a momentary loss of consciousness or giddiness, associated with hemiparesis or aphasia which may disappear in a few weeks. times coma supervenes after paralysis has appeared, and frequently a stroke consists solely of a slowly developing hemiplegia that may become complete without any disturbance of consciousness. In many cases it is impossible at the bedside to be certain of the nature of the

lesion responsible for the stroke. In general, embolism is usually the cause in young people with simple or infective endocarditis; between 20 and 40 years, thrombosis from syphilitic arteritis is most common, and after 40, either thrombosis or rupture may occur. With embolism or hemorrhage the onset is usually sudden in a patient with high blood-pressure, hypertrophied heart or renal disease, whereas thrombosis often develops slowly, with premonitory symptoms lasting perhaps for hours, and frequently occurs in the night. Neither these preëxisting conditions nor the mode of onset are, however, a sure guide.

> A case of traumatic encysted hemorrhage in the brain is reported by E. J. Stein (Atlantic Med. Jour., Jan., 1924). The patient had been kicked in the left occipital region while playing football, becoming unconscious a short time, and after playing again a week later, developed dizziness, vomiting, and horizontal diplopia. Six weeks after, he had severe pain over the right eye, with fulness of the retinal veins, slow pulse, and a spinal pressure of 40 mm. At operation (right temporal craniotomy), much old fluid and clotted blood was evacuated from an encysted hemorrhage extending forward over the frontal lobe to the orbit. The blow on the left occiput is thought to have injured by contrecoup the vessels of the right frontal area. Recovery eventually followed.

TREATMENT.—Aside from absolute rest in bed, quiet and slight elevation of the head and shoulders on a pillow, Riddoch (loc. cit.) advises that the unconscious apoplectic patient lie on his side, preferably on a water-bed. The nurse must see that his head does not drop forward. Catheterization may be necessary. To prevent bedsores, the skin should be cleansed night and morning with

soap and water, dried, rubbed with alcohol, and dusted with boric acid powder. For a restless, semi-conscious patient, provided he can swallow, the following draught is satisfactory: Potassium bromide, 20 grains (1.25 Gm.); chloral hydrate, 12 grains (0.8 Gm.), in peppermint water, to make 1 ounce (30 c.c.). Morphine is permissible if indicated. As for the diet, starvation for the 1st 24 hours is probably best. Sips of water may be allowed. After the 1st day a semi-fluid diet can be given, if necessary in the form of nutrient enemas.

If the patient is feeble and his heart-action poor, alcohol and digitalis are often beneficial. In evident vascular rupture, calomel or croton oil is generally considered advisable, followed by an enema. If the lesion is clearly thrombotic, especially with weak heart-action, purgatives should be avoided, but enemas and mild laxatives can be used. In syphilitic cases mercury intramuscularly is useful, although arsenicals such as sulpharsenol can be given in small doses into the buttock weekly under strict asepsis. When the patient can swallow, potassium iodide, 10 to 20 grains (0.6 to 1.2 Gm.) thrice daily, should be given. Venesection is now rarely employed. In the less severe cases, in which signs of bulbar compression are absent, careful drainage of spinal fluid by lumbar puncture is relatively safe and often rapidly relieves the general cerebral symptoms. In cases with rising blood-pressure and Cheyne-Stokes respiration, a decompression operation seems clearly indicated.

CEREBRAL HEMORRHAGE IN THE NEWBORN.—Alfred Gordon (Amer. Jour. of Obst. and

Gyn., Apr., 1924) differentiates the supratentorial from the infratentorial form of hemorrhage in these cases. In the former one finds a bulging fontanel and a group of nervous phenomena, such as sleeplessness, restlessness, and convulsive seizures, the condition persisting. In the infratentorial cases there are considerable depression, apathy, somnolence, early cyanosis, vasomotor and respiratory manifestations, and rigidity of the neck muscles. In infratentorial cases lumbar puncture may be of much benefit, while in the supratentorial, early craniotomy is almost the only resort and is directly in-

The most common instances of intracranial hemorrhage in the newborn, according to W. Sharpe and A. S. Maclaire (Surg., Gyn. and Obst., Feb., 1924), are the extremely mild ones, generally overlooked, with slight drowsiness, apathy, a few muscular twitches, failure to nurse properly, and feeble or irregular respirations. Among 100 consecutive newborn babies, lumbar puncture with a hypodermic needle revealed bloody spinal fluid in 13 instances, ranging from straw to cherry red. The writers advocate lumbar puncture as a safe routine procedure (in the absence of shock) in suspected cases with the mildest signs of intracranial hemorrhage and cerebral edema within 72 hours after As a valuable aid to the natural absorption of blood they recommend repeated lumbar puncture at intervals of 6 to 24 hours in cases of bloody spinal fluid under varying degrees of pressure. If this repeated drainage fails to lower progressively the blood content and

pressure, a modified subtemporal decompression and cranial drainage as described by Cushing is indicated. Early use of calcium lactate or blood serum to reduce the intracranial hemorrhage may be of service. Even the milder degrees of intracranial hemorrhage, if improperly treated, often develop later some form of spastic paralysis, with or without mental impairment. Cerebral spastic paralysis due to hemorrhage should be differentiated from Little's disease —the latter including only cases due to cerebral agenesis and meningoencephalitis.

> To favor coagulation, frequent handling of the infant should be avoided in these cases, as advised by J. A. Foote (So. Med. Jour., June, 1924). Injection of blood or other substances rich in thrombin should always be resorted to. If no blood is immediately available, 10 c.c. of thromboplastin should be given subcutaneously. Rest for 7 to 10 days should be ordered. Favreau and Rautureau (Bull. Soc. d'obst. et de gyn. de Paris, xiii, 192, 1924) observed very favorable effects on the respiration from subcutaneous and intramuscular injections of 10 c.c. of oxygen in a child partly asphyxiated by a coil of cord about the neck, after other measures had had little effect. The child died 2 days later, however, and the necropsy revealed a hemorrhage in the left lateral ventricle.

# CEREBROSPINAL FLUID.

In a summary of present conceptions relative to the cerebrospinal fluid, W. C. Menninger (Jour. of Nerv. and Ment. Dis., Aug., 1924) alludes to its source as chiefly from the choroid plexus and slightly from the ependymal layer of the ventricles, the perivascular channels over the cortex, and the posterior lobe of the pituitary. Circulation of the fluid probably occurs, but very slowly, especially in the spinal region. Absorption takes place chiefly through the great dural sinuses directly into the blood, slightly through the perineural

sheaths of the cranial nerves. Increase of pressure occurs with inflammation, probably because of disturbed absorption. Albumin is present normally, but not globulin in detectable amount. Glucose is present in slightly less concentration than in the blood; it increases in diabetes and encephalitis, decreases in most meningeal inflammations, and remains unchanged in most other conditions. Lactic acid and urea are normally present only in traces; the latter increases in nephritis. Normal fluid contains 3 to 6 lymphocytes per cu. mm., rarely any large lymphocytes, and no red cells. Lymphocytosis suggests a chronic disturbance and polynuclear leukocytosis an acute one.

TENSION .- That variations occur in cerebrospinal fluid pressure readings according to the time elapsed after puncture, the posture, etc., is pointed out by H. C. Solomon, H. M. Pfeiffer and L. J. Thompson (Amer. Jour. Med. Sci., Sept., 1923). With the patient lying on his side and the back well flexed, the pressure recorded shortly after insertion of the needle is apt to be 2 to 4 times as great as that obtained after 10 minutes. Readings on patients who are fearful or struggling may be increased 300 or 400 per cent. To have a standard in estimating the pressure, the following rules should be observed: (1) The patient should be relaxed both mentally and muscularly; (2) the observation must continue at least 6 or 7 minutes; (3) the pressure must have remained nearly constant for 2 or 3 minutes, before the reading is accepted. R. Bárány (Acta oto-laryng., v, 390, 1923) has the patient breathe deeply until no further fall of pressure occurs, then waits for straining, cough and the change due to deep breathing to pass off before making the reading. He regards 40 to 60 mm, as the normal pressure in recumbency.

Ayala's cephalorachidian (cerebrospinal) index is deemed clinically useful by Balduzzi (Encéphale, Feb., 1924). It consists of the figure representing the final cerebrospinal fluid pressure, multiplied by the quantity of fluid withdrawn, divided by the initial pressure. In meningitis the index may rise even above 9, while in tumors it ranges about 3.

CELL CONTENT.—According to A. V. Neel (Ugeskr. f. Laeg., Sept. 13, 1923), the normal cerebrospinal fluid is very constant in its contents of cells as well as of albumin. In 1118 tests in diseased states as well as 699

in other subjects he always found evidence of syphilis or other organic disease when the cells exceeded 1 in 3 cu. mm. Organic disease is reliably excluded by cells not exceeding this amount, with absence of globulin, and albumin, 10.

SUGAR.—In a study of the sugar in 421 spinal fluids, including various diseased conditions, B. J. Alpers, C. J. Campbell and A. M. Prentiss (Arch. of Neurol. and Psych., June, 1924) found a normal range of 50 to 65 mgm. per 100 c.c. of spinal fluid. In epidemic encephalitis (35 cases) the average was 82 mgm.; in untreated paresis (25 cases), 65 mgm.; in treated paresis (163 cases), 55.4 mgm.; in dementia pracox (21 cases), 80.1 mgm., and in manic-depressive insanity (11 cases), 66.9 mgm. Several cases of untreated paresis showed an increase of sugar as high as in epidemic encephalitis. In 2 cases of diabetes mellitus, the readings were 123 and 189 mgm.

A. G. Kelley (So. Med. Jour., June, 1923) finds the sugar content decreased in untreated syphilis of the nervous system, in meningitis due to the meningococcus, Staphylococcus aurcus or pneumococcus, and in moribund cases. There is enough evidence to warrant the opinion that Spirochæta pallida, when present in the cerebrospinal fluid, utilizes the sugar normally existing in it.

According to B. Steiner (Jahrb. f. Kind., June, 1923), a drop in the sugar content may be the 1st evidence of tuberculous meningitis. In a typical case it dropped from 43 mgm. to 0 in 9 days. This finding is useful to determine the nature of a doubtful meningitis in brain abscess, typhoid fever, or other infections.

CHLORINE.—B. Steiner and R. Beck (*Ibid.*, Nov., 1923), determining the chlorine content in 135 spinal fluids by a micromethod, concluded that the normal content is 0.68 to 0.72 per cent., and that it diminishes from the start in meningitis. A fall below 0.5 per cent. definitely points to meningitis. A rise after a fall is evidence against tuberculous meningitis.

CALCIUM.—Though calcium showed great constancy, Depisch and Richter-Quitt-ner (Wien. Arch. f. klin. Med., Jan. 30, 1923) observed absence of it in some patients, all of whom were cases complaining of headache. The same symptom was noted in the cases with abnormally high calcium content. Having examined 115 spinal fluids, Critchley and

O'Flynn (Brain, Aug., 1924) place the normal calcium content at 6.2 mgm. per 100 c.c. They found no marked diminution of it in any nervous disorder other than *tetany*, in which there is a marked fall in the lime content during the acute phase, the calcium then rising during convalescence with greater rapidity than in the blood.

COLLOIDAL REACTIONS AND OTHER TESTS .- Neurosyphilis .- According to L. H. Cornwall (Jour. of Lab. and Clin. Med., Mar., 1924), positive reactions with both the blood and spinal fluid always indicate neurosyphilis. A positive blood and negative spinal fluid, in the presence of clinical signs, call for the elimination of other etiologic factors. A negative blood never excludes neurosyphilis in the presence of suggestive clinical signs. A severe cellular meningeal reaction-100 to 500 cells per cu. mm.-suggests superficiality of the lesions and a hopeful prognosis. Increased globulin merely indicates irritation. A positive spinal Wassermann means neurosyphilis. The colloidal gold reaction alone cannot diagnose neurosyphilis, but must be interpreted in conjunction with the other laboratory and clinical findings. Changes in it under treatment are valuable prognostically.

The serum and spinal fluid in general paralysis do not necessarily both give a positive Wassermann reaction. Of 90 patients whose spinal fluid was tested only 73 were positive, and of 70 serums tested, only 49, according to J. Lofthus (Norsk Mag. f. Laeg., Sept., 1924). The Kahn test is recommended by J. S. Dudgeon (Lancet, Sept. 20, 1924) as a good confirmatory test and a routine test for an institution or where a Wassermann is impracticable. Among 93 bloods from cases of general paralysis, the Kahn and Wassermann were both positive in 83. Among 61 spinal fluids, the Kahn was positive in 52 and the Wassermann in 54.

In addition to the colloidal gold reaction, the colloidal mastic test is also at times being used. H. Wassermann (Arch. of Int. Med., Mar., 1924), noting first of all that treatment of syphilis in general should include routine studies of the spinal fluid (cell count, globulin, Wassermann and a colloidal test), recommends the mastic test because of its simplicity as compared to the colloidal gold test and because its delicacy is equal to or slightly greater than that of the gold test. The stock mastic

solution, which has the advantage of not deteriorating on standing, is made by dissolving 10 Gm. of commercial gum mastic in 100 c.c. of absolute alcohol and filtering repeatedly until a clear straw-colored solution is obtained. From this the mastic emulsion is prepared by adding 1 c.c. of it to 9 c.c. of absolute alcohol and the latter then, with gentle mixing, to 40 c.c. of distilled water. For the test, 1.5 c.c. of a stock salt solution (99 c.c. of 1.25 per cent. sodium chloride solution + 1 c.c. of 0.5 per cent. potassium carbonate solution) is placed in the 1st of 10 small test-tubes, and 1 c.c. in each of the others. One-half c.c. of the spinal fluid to be tested is next placed in the 1st tube, and a series of dilutions then made by transferring 1 c.c. from each tube into the next tube in the line. After mixing, the tubes are allowed to stand over night at room temperature. The readings are similar to those in the colloidal gold reaction, and are divided into 5 grades, ranging from opalescence (no change) in the 1st to clear fluid with complete precipitation in the 5th. The typical curves include a paretic zone, syphilitic zone, "mastic 3" curve, and negative. In 1498 spinal fluids tested the mastic and gold tests were in agreement in all but 12.3 per cent., the latter comprising 157 fluids which gave positive mastic curves when the gold was negative and 52 in which the reverse was true. Wüllenweber (Klin. Woch., Sept. 23, 1924) stresses the superiority of the mastic over the gold test where the spinal fluid is mixed with blood.

In France the colloidal benzoin reaction is being used as the substitute for the gold reaction. J. A. Braxton Hicks and J. Pearce (Brit. Med. Jour., Feb. 16, 1924), having employed it in over 200 patients, deem it almost as sensitive to central nervous syphilis as the Wassermann reaction. They do not, however, consider that there is a characteristic syphilitic curve as contrasted with a paretic curve. No disease other than syphilis gave a positive result. G. Milani (Rif. med., Mar. 10, 1924) deems the test of great value in general paralysis.

According to Flockenhaus and F. Fonseca (Deut. med. Woch., Aug. 1, 1924), Pandy's test and the colloidal gold test are sufficient in most instances. The sediment should be especially examined to exclude blood admixture. The Wassermann reaction is of value to exclude multiple sclerosis, for in 2 such

cases a paralysis curve was shown in the gold test.

Tuberculous Meningitis.-For use in distinguishing this disease, K. Wattner (Klin. Woch., iii, 1217, 1924) describes a test for fibrin in the spinal fluid. To the fresh fluid in a test-tube he adds about ½ its volume of a 10 per cent. solution of potassium or sodium hydroxide and shakes gently. If fibrin is present, the air-bubbles set free fail to rise to the surface or do so only very slowly. The test is advantageous in that its result is known within a few moments after the lumbar puncture. G. P. Porta (Pediatr., Dec. 15, 1923), from clinical tests, concludes that tuberculous meningitis is excluded if Pandy's test, Boveri's potassium permanganate test and the tryptothan test are all negative. A positive tryptophan test obtained with clear cerebrospinal fluid is presumptive evidence of the presence of tuberculous meningitis.

DISCOLORATIONS.—The surgeon should not depend absolutely on bloody spinal fluid as a sign of injury, for there are conditions that may cause such a discoloration independently of injury. According to C. L. Palmer (Atlantic Med. Jour., June, 1923), both bloody and yellow spinal fluid occur in a great variety of conditions in practically all ages. Bloody spinal fluid may probably be due to: Conditions within the blood, such as purpura or any disorder which reduces the coagulating power of the blood; vascular changes, due to various toxemias and infections, and various mechanical factors causing stagnation and varicosities of the veins (spinal tumors, curvature). A yellow color of spinal fluid (xanthochromia) is probably due to pigments derived from blood of a slight previous hemorrhage. Careful search should be made by spinal fluid and blood examinations, particularly the coagulation time, as well as examination of the retina for sclerotic vessels, in order to obtain evidence of earlier underlying conditions which may have caused the yellow spinal fluid previous to the development of, and without relation to, the existing disease.

MICRO-ORGANISMS.—According to Warthin, Wanstrom and Buffington (Arch. of Derm. and Syph., Oct., 1923), the staining of sections of spinal fluid coagula by the Warthin-Starry method is valuable for the demonstration of *spirochetes* in this fluid, as well as in serums or other fluids. U. J. Wile

and A. Kirchner (Ibid., Dec., 1923) likewise endorse the Warthin-Starry method, in which, in order to obviate centrifugation and breaking up of the spirochetes, kaolin is added to the spinal fluid and allowed to settle, thereby precipitating the organisms. Instead of kaolin, an aluminum cream may be used. This is prepared by treating alum with ammonia, precipitating, and washing the precipitate by decantation until no more ammonia is given off, as shown by a negative litmus test. Among 115 cases examined, there were positive findings in 9 and suggestive findings in 3. The spinal fluid must be regarded as having a spirochetal content in cerebrospinal syphilis, and therefore, as an infectious secretion.

CERVICAL RIB. -W. M. Brickner and H. Milch (Surg., Gyn. and Obst., Jan., 1925) report a case of presumed cervical rib which proved to be a maldeveloped 1st dorsal rib bearing an articulation on its shaft. The condition had never produced any symptoms, but the patient had a bony-hard mass at the base of the neck on the right side. In regard to the non-operative treatment of true cervical rib, they quote Stopford concerning the benefit to be derived by exercises designed to develop the trapezius, particularly its upper fibres; traumatic cases respond well to exercise, massage and judicious use of the faradic current. All cases, and especially those in which operation is contraindicated, should be given a trial of support and muscle training. In a case of rudimentary cervical rib, largely cartilaginous, seen by the writers, elevation of the shoulder with a ribbon sling, to be used as much as possible, gave considerable relief. If there is continued pain or progressive nerve or vascular interference, resection of the rib should not be delayed.

According to Crouzon (Presse méd., Nov. 21, 1923), hypertrophy or "dorsa-

lization" of the transverse process of the 7th cervical vertebra should be kept in mind as a condition causing the same symptoms as cervical rib.

CESAREAN SECTION.—Discussing asphyxia of infants delivered by Cesarean section, Küstner (Zeit. f. Geb. u. Gyn., Feb. 10, 1923) ascribes this tendency to the anesthetic administered to the mother, which reduces the sensibility of the child's nervous centers to carbon dioxide; this is even more marked where morphine has been given. A 3d factor is the preparatory intermittent stimulation of the child's respiratory center which results in normal deliveries from the shutting off of the oxygen supply to the fetus because of interrupted circulation during the labor pains. In the child delivered by Cesarean section this preliminary training for respiration does not occur, and establishment of breathing is correspondingly more difficult. Artificial respiration by the Schultze (swinging) method is called for in these cases.

In a series of 116 cases of Cesarean section recorded by E. F. Murray (Brit. Med. Jour., July 12, 1924), in most of which the operation had been performed to anticipate or relieve obstructed labor due to pelvic contraction, there were 10 deaths among the mothers and 14 deaths of infants. Forty-three women operated on early in labor with unruptured or recently ruptured membranes all lived, as did also all the infants.

OPERATIVE METHODS.—The transperitoneal low or cervical Cesarean section is being endorsed by a number of operators. Phaneuf (Surg., Gyn. and Obst., Dec., 1923) enumerates its advantages as follows: Protection

against septic peritonitis; no shock from handling intestines; less bleeding; easier puerperium; better healing; less risk of later rupture. An efficient test of labor can be safely given. Gaifami (Rev. franç. de gyn. et d'obst., Jan. 25, 1923) extols the method on the basis of 50 cases. In 11 of these the section was later repeated, and in all a firm cicatrix was found. H. Huber (Schweiz. med. Woch., Oct. 23, 1924) lauds the cervical operation on account of its greater simplicity and the better prognosis for the child.

Klingefuss (*Ibid.*) records 18 successful transperitoneal operations in which Fonio's method of *extraperitonealization of the uterine wound* was carried out. This procedure permits of operation even in infected cases.

E. M. Hodgkins (Boston Med. and Surg. Jour., May 29, 1924) praises and describes the Hirst type of transperitoneal section, in which the peritoneal cavity is protected, the layers are rapidly sealed, and in cases of puerperal sepsis the drainage is extraperitoneal. Few intraperitoneal adhesions can result. He notes that in all cervical operations some labor is necessary, in order that the lower uterine segment may be thinned out and widened and the tissues rendered looser for separation. Dilatation of the cervix is imperative on account of the location of the incision and drainage. In his 43 cases there were no maternal deaths and but 3 fetal deaths.

A plea for extraperitoneal Cesarean section in cases of mismanaged and prolonged labor is made by A. B. Davis (Amer. Jour. of Obst. and Gyn., Apr., 1924). These are the cases which give the high maternal and fetal mortality after section, and this operation, he maintains, will save some lives that would otherwise be lost.

LOCAL ANESTHESIA.—According to J. B. De Lee (Surg., Gyn. and Obst., Feb., 1925), local anes-

thesia should be the method of choice for all Cesarean sections, including the cervical. Acidosis and pneumonia are avoided, recovery is smoother and quicker, the indications for the operation in borderline cases can be extended, and in heart, respiratory, kidney and liver cases the method is almost indispensable. At the Chicago Lying-In Hospital 5 operators have performed 67 laparotrachelotomies (low or cervical Cesarean sections) under local anesthesia alone or aided with a little ether or gas, with a resulting remarkable freedom from various forms of morbidity which are rather common after ether. While the mortality of a general series of 338 laparotrachelotomies-mostly under ether-was but 0.66 per cent., the writer is convinced the mortality can be further lowered by local anesthesia. Previous to the latter, the patient's mind is prepared for the procedure, if time permits. The anesthetic is 0.5 per cent. novocaine, to each ounce of which, after it is sterilized, is added 2 drops of 1:1000 adrenalin. average amount of solution used is 7 ounces, and the range,  $3\frac{1}{2}$  to 10 ounces.

The procedure comprises successive infiltration of the abdominal incision, superficial fascia, intercostal nerves as they enter the rectus sheath, peritoneum, cavity of Retzius, and subperitoneal space of the vesicouterine plica. The uterus itself is not desensitized unless the patient is in active labor, in which case a few cubic centimeters are injected in the line of incision. During the delivery of the child, about ½ the women require a little gas. By the time the patient's consciousness has returned

the placenta is out—usually through traction on the cord,—and 3 hypodermics are given: Pituitrin; morphine, ¼ grain (0.015 Gm.), and scopolamine, ½<sub>00</sub> grain (0.0003 Gm.). There is almost uniform primary healing. *Eclampsia* is included among the particular indications for the method, on account of the marked dangers from acidosis under general anesthesia.

CHANCROID.—A streptobacillus having the morphologic and cultural characteristics of the Ducrey bacillus, and which J. Brams (Jour. Amer. Med. Assoc., Apr. 12, 1924) deems identical with the Ducrey bacillus was isolated by him from 5 out of 30 normal men (27 colored) having a large accumulation of moist foul-smelling smegma. Persons apparently normal may be carriers of the Ducrey bacillus, and a person need not necessarily acquire the disease during sexual intercourse with an infected partner. The so-called "mixed infection" does not mean that the person was exposed to a partner who had both chancroid and syphilis.

These observations account for the occurrence of genital sores resembling chancroids in persons who have not been exposed to venereal infection. With A. F. Lash, the writer has recovered the same organism from the cervix and clitoris of women having no genital sores.

Attempting to perfect the bacteriologic diagnosis of chancroid, C. C. Saelhof (Jour. of Inf. Dis., Dec., 1924) was able to isolate the Ducrey bacillus in only 65 per cent, of clinically diagnosed chancroids. Involutional forms of the organism are marked and are extremely variable.

Reenstierna has devised an intradermal test for chancroid, and, according to C. Nicolle and P. Durand (Presse méd., Dec. 27, 1924), this test is specific and reliable provided the lesion is a few days old. It may appear as early as the 8th day, and is still positive after 10 years or more. The material used consists of suspensions of dead germs, which are difficult to prepare on account of the granular condition of the cultures and the presence of blood in the medium. In positive cases, after inoculation of a few drops of the suspension, there appears a papule with surrounding erythema and edema, and at times even a small pustule. Out of 173 clinical chancroids only 11 failed to react, and in 8 of these the clinical diagnosis was recognized to have been in error.

TREATMENT.—Reenstierna (Arch. f. Derm. u. Syph., cxlvii, 362, 1924) reports further on his serum treatment of chancroid and the commonly associated bubo. Out of 153 cases treated with it, only 8 were not benefited, and of these 7 were found to have a staphylococcic basis, while the 8th was syphilitic. The effect of the serum has been greatly increased by adding killed cultures of typhoid bacilli in order to raise the patient's temperature, the bacillus of Ducrey being very sensitive to heat. The duration of the disease, ordinarily averaging 1 month, is shortened by the treatment to but little over 1 In some cases the chancroid healed without local treatment, though in others the margins of the ulcer had 1st to be excised and cleansed. Hot applications aid in the treatment. Buboes, if not previously incised, healed in 5 to 10 days.

The injections were made *intra*cutaneously in the buttock, and were usually 2 in number, 3 to 5 days apart.

Nicolle and Durand (loc. cit.), having observed cases under treatment by Reenstierna, consider his serum superior to all measures previously in use, but prefer their own procedure of intravenous injections of antistreptobacillus vaccine. This route is used because the local reaction on subcutaneous injection is too violent. As advised by Reenstierna, the germ is isolated from tissue taken from the base of a reinoculation ulcer, and is cultured on fresh 3.5 per cent, agar with 1/3 of its weight of defibrinated rabbit's blood. The bacillus lives only 3 days on this medium, but the writers have devised another, on which it will live 6 weeks. A soft agar preparation is used, having the following formula: Bouillon, 1 liter; agar, 2.5 Gm., and ordinary or potato starch, 10 Gm. Only 1/5 volume of rabbit blood is added, and the reinoculations are made at the surface. The dosage deemed best is 1 to 1½ c.c. of the suspension prepared by the writers, increased to 2 or 3 c.c. Injections are given every 2 or 3 days; 3 to 6 injections generally suffice. No local treatment other than an aseptic dressing is required. The constitutional reaction usually does not exceed 1/2 a day, and is far less intense and disturbing than that from Reenstierna's serum. Of 41 cases receiving the vaccine all but 1 were cured in 12 days where there were no buboes, and in 17 days in cases with buboes.

In Saelhof's (loc. cit.) experience, the use of vaccines in a few instances gave practically negative results, equally good effects being obtained by local treatment,

for which silver nitrate and mercurochrome were most efficient.

According to H. Goodman (Jour. of Urol., Apr., 1925), the diagnosis of chancroid is best made by clinical observation, with absence of Spirochata pallida on dark field examinations, a negative Wassermann reaction, and absence of the Calimatobacterium granulomatis of inguinal granuloma. In the treatment, in addition to soap and water, immersion in warmed mercuric chloride, 1:8000, for 20 minutes 3 or 4 times daily, and a dosal slit with the cautery knife when required, he employs intravenous injections of 1 per cent. tartar emetic solution, from commercial sterilized and sealed ampoules. Four to 8 injections are given at 2 to 5 day intervals, beginning with 5 c.c., and sometimes increasing by 1 c.c. at each injection, to a maximum of No ill effect other than 12 c.c. transient pain in the shoulder on the side of the injection was observed.

Lacapère and Galliot (Soc. de dermat. et syph., Jan. 10, 1924) have had satisfactory results with radium, used without filtration or in the form of pastes containing small amounts of radioactive salts. On the day after treatment there is a free discharge containing many polynuclears. This ceases after a few days and healing rapidly follows, cure resulting in about 2 weeks.

PHAGEDENA.—In phagedena attending chancroid, chancre or other infections, Carle (Ann. des mal. vén., July, 1924) gives iodides by mouth in a dosage which is quickly increased to 3 to 5 Gm. (45 to 75 grains) a day, regardless of iodide symptoms. Locally, 3-volume hydrogen peroxide solution or a very

dilute potassium permanganate solution is used before retiring, and plain petrolatum applied with gauze overnight. Bromides, valerates or other sedatives may be used at night if required. In the daytime the parts are sprayed at intervals with bland herb infusions or sterile water, and a moist compress applied in the intervals. For severe pain, a compress moistened with cocaine or stovaine solution may be used. When the phagedenic process has been definitely arrested—which is a matter of but a short time under this treatment —local applications of a 0.05 per cent. solution of methylene blue are made. and afterwards, when the tissues are clean, an ointment containing oil of cade, balsam of Peru, camphor and zinc oxide in a base of petrolatum and hydrated wool fat. The iodides by mouth should be continued for some weeks after complete healing, and resumed if ulceration should reappear.

CHARCOAL.—While a number of authors have denied therapeutic value of charcoal in flatulence, M. L. Bowman (Boston Med. and Surg. Jour., Aug. 28, 1924) administered an aqueous suspension of kelp charcoal (dose not mentioned) to 9 cases suffering from eructation, flatulence, or both. with apparently favorable effects. Underlying the condition were cardiac disease, 4 cases, and typhoid fever, ptosis and constipation, chronic gall-bladder disease, chronic duodenal ulcer, and effort syndrome, 1 each. Aside from the patients' statement of relief, daily percussion and actual measurements of the abdomen were carried out. The patients with distention were more relieved than those complaining chiefly of eructation, but the latter were air swallowers in all but 1 instance, and this patient was relieved. Experiment showed that kelp charcoal in solution does not absorb gas, but on the contrary enhances its production by bacteria. It also inhibits the activity of the gastric ferments. The 1 patient relieved of eructation suffered from gastric ulcer and hyperacidity. In relieving distention it may possibly act either by altering gastrointestinal ferments toward normal, by irritating a sluggish alimentary tract, or by absorbing accumulated toxic substances. Kraus and Barbara have shown absorption of bacterial toxins by charcoal both in vitro and in the organism. De Houssay has shown the absorption of snake venom, and Joachimoglu has shown the prevention of strychnine poisoning in dogs by charcoal.

Experiments are recorded by Rakusin and Nesmejanow (Münch. med. Woch., Aug. 22, 1924) demonstrating a marked absorption of dissolved salts of mercury and silver and, to a less extent, of lead by vegetable charcoal. Bechhold (*Ibid.*, Sept. 7, 1923) observed that treating animal charcoal and kaolin with small amounts of silver preparations augmented their absorptive property and added a pronounced germicidal action.

# CHAULMOOGRA OIL. — See LEPROSY.

CHENOPODIUM OIL.—The active principle of oil of chenopodium has been found by W. G. Smillie and S. B. Pessoa (Jour. of Pharm. and Exp. Ther., Dec., 1924) to be ascaridole, a compound having a definite chemical formula. It is not proportionately more toxic than the oil, and has an extremely powerful action in hookworm disease. The proper adult dose is 1 c.c. (16 minims), given on an empty stomach in the early morning and followed in ½ hour by magnesium sulphate. One treatment with it will remove 95 per cent, of the hookworms (Necator americanus) harbored. The lighter fractions of oil of chenopodium have no anthelmintic action.

med. Woch., Aug. 22, 1924) reports a fatal case of poisoning by this oil, and discusses several cases previously recorded. The symptoms consist of weakness or coma, together with clonic and tonic convulsions affecting only a part of the body and sometimes followed by paresis or paralysis of the involved region. The milder toxic symptoms are headache, nausea, vertigo, or vomiting with weakness. The sense of hearing is sometimes affected. The usual cause of poisoning is excessive dosage, though in some cases such conditions as status thymolymphaticus, malaria and anemia have caused death in spite of ordinary

dosage. The drug is contraindicated in cases of severe chronic illness, general weakness and disturbances of hearing.

THERAPEUTICS.—The following procedure in using oil of chenopodium as anthelmintic is advised by Doran (So. Afr. Med. Rec., Oct. 25, 1924): A light meal, such as rice or bread and milk, is allowed 12 hours before the drug is given. The dose is divided into 2 equal portions, to be taken 1 hour apart. From 1 to 2 hours later a large saline purge is given. The treatment is repeated after a few days if any signs of parasites persist. The 1st dose used should always be small, with due allowance for age, sex and general condition. No other vermifuge should be combined with the drug. The heart and urine should always be examined beforehand.

Cheinisse (Presse méd., Mar. 1, 1924) notes that oil of chenopodium is indicated also in ascariasis. In oxyuriasis its action is uncertain. It is ineffective against tapeworm. It is contraindicated by acute diseases; fever decreases tolerance to it. Purgation after the oil is not indispensable, though advisable if there is constipation. In children the dose, as stated by Brüning, is 1 drop per year of age.

#### CHEST. - X-RAY DIAGNOSIS.

According to L. Eideken (Med. Jour. and Rec., May 21, 1924), the following are the most important conditions in which X-ray differential diagnosis is helpful: Pneumonia from acute appendicitis, especially in children; empyema from subphrenic abscess; pleurisy from cholecystitis; traumatic pneumothorax or hemopneumothorax from intra-abdominal perforation and traumatic hemorrhage; cardiac and aortic lesions from suspected gastric and duodenal lesions; lower esophageal conditions from gastric lesions, and tumors of the liver and spleen from masses in the lower lobes of the lungs. Pneumonia with consolidation is clearly demonstrable on X-ray films and often fluoroscopically. In empyema the diaphragm is invisible, the costophrenic angle obliterated, the lung replaced in its lower portion by a dense shadow, and a fluid level seen; in subphrenic abscess the diaphragm is elevated and more or less fixed, the costophrenic angle clear, the lung normal, and the liver of increased density. In gall-bladder disease, calculi or a gall-bladder shadow may be visible. Violent trauma may result in diaphragmatic hernia, which the X-ray is almost certain to

detect after a bismuth meal. In severe chest injury, the X-ray usually shows fractured ribs, the presence of air, sometimes fluid (blood) and air, depression of the diaphragm, collapse of the lung and displacement of the heart toward the unaffected side. Cardiac or aortic lesions producing epigastric distress may show a markedly enlarged heart, a widened, calcareous aorta, or a pulsating aneurismal mass. Cardiospasm and organic esophageal stricture are readily differentiated from gastric lesions. Masses in the lungs are very frequently demonstrated above the diaphragm, as against tumors of the liver, kidneys or spleen below it, though to distinguish the latter organs from one another, pneumoperitoneum may be required.

In order to bring out clearly such details as tuberculous clouds, tumor metastases, enlarged thymus, etc., E. B. Knerr (Radiol., July, 1924) has found it very advantageous to make all vertical chest plates at a distance of 7 feet, with exposures of ½ to 3 seconds, using superspeed films with double intensifying screens. The radiator tube is set at 5 inch gap and 30 ma. Faint densities in the soft tissues in large plates are better distinguished by inspecting them through a 4-inch concave (reducing) reading-glass from a distance of 5 or 6 feet.

# CHEST SURGERY.—ABSCESS.

—In treating 40 cases of cold abscess of the chest wall, T. De Waard (Ned. Tijd. v. Gen., Nov. 17, 1923) generally employed puncture, injections of gomenol, and X-ray treatments. In 3 cases rib resection was needed. Twenty patients were cured. In others sinuses persisted, and a few died. The possibility of Pott's disease should always be kept in mind in making the diagnosis, especially in abscesses situated near the spinal column.

Tuberculous pleurisy, caries of the ribs or their cartilages, and caries of the sternum are stressed by H. Ito (Zeit. f. Chir., Apr., 1924) as the sources of cold abscesses of the chest wall. In the treatment, he advises

removal of the abscess membrane followed by complete closure of the wound in order to obtain healing by 1st intention. This proceeding is based on the fact that the cold abscess, aside from the tubercle bacilli it contains, is aseptic. To fill the space left by the excision a pedicled employed. This muscle-flap is method is advocated even in abscesses which have already ruptured, provided there are no evidences of mixed infection, for healing is accelerated by it.

INJURIES.—Reflex bands of dullness, previously described by C. Riviere in cases of phthisis, were observed by A. N. Cox (Lancet, Apr. 7, 1923) in 24 out of 28 cases of old chest wounds with retained foreign body. These bands are characterized by impaired resonance to gentle percussion across the lower scapular region on both sides of the back, about the level of the 5th to the 7th dorsal spines. These cases may closely resemble phthisis, with dyspnea on exertion, cough, hemoptysis and pains in the chest, though the toxic symptoms of active tubercle, such as tachycardia, sweats, anorexia and headaches are usually lacking. The signs and X-ray shadows are often very puzzling, and in some cases only repeated negative sputum examinations will exclude tuberculosis. Lung wounds are only rarely followed by tuberculosis—2 cases among the writer's 65. The band sign and the symptoms suggest that a piece of metal retained in the lung keeps up a chronic irritation. In some cases the band of dullness was found as long as 7 years after the wound. Among cases with a retained projectile pain was a relatively prominent symptom, while in others dyspnea was most frequently complained of.

TREATMENT.—The harmlessness of thoracotomy is stressed by K. W. Doege (Jour.-Lancet, Jan. 1, 1924), who advocates its use in all serious chest injuries. He has never seen any respiratory embarrassment following an accidental or purposeful complete unilateral pneumothorax. Suddenness and wideness of opening are the factors causing distress. Placing the patient on the side to be dealt with opposes the mediastinal disturbance otherwise induced, and the difficulty of operating with the patient in this posture is minimized by causing the affected side partly to overhang the edge of the table. Anesthesia must complete. be Nitrous oxide-oxygen is preferable to local anesthesia, as it permits of increasing the intrapulmonary pressure when this is desirable, but the writer used ether in his cases. If dyspnea develops, Mueller's method of seizing the collapsed lung with an instrument or the hand and pulling it into the wound is very effective; to hold it in position it may be stitched to the pleura. When the condition in the thorax has been explored and dealt with, an effort is made to overcome the pneumothorax before the last stitches are tightened. No drainage is used.

In a case of gunshot wound of the chest reported by K. Connell (Neb. State Med. Jour., May, 1924), the pleural cavity was filled with blood and air, and the missile, having passed through, was removed from beneath the skin posteriorly. No symptoms calling for drainage arose until the 10th day. The writer did a valvular thoracotomy, opening the chest with rib resection, but

immediately after converting the drainage tract into a valve functioning outward. This operation consists of raising upward a semicircular skin flap, beginning in the 10th interspace in the midscapular line, then resecting the 9th rib, opening the thorax without loss of exudate, and inserting a strip of celluloid film (X-ray) 11/2 inches wide by 6 inches long, so as to project into the pleural cavity. The skin flap is then sutured back in place, except at the dependent exit of the celluloid strip. Valvular drainage is thus afforded, the soft parts opening readily in expiration and closing in inspiration. In addition a blow bottle is used hourly against a pressure of 2 feet of water, and the cavity flushed daily with Dakin's solution.

TUMOR.—Of 8 cases of intrathoracic tumor reported on by G. J. Heuer (Ann. of Surg., May, 1924), 3 were instances of pleural endothelioma, a condition described as an extensive, diffuse tumor formation producing a thickened pleura and associated with a bloody effusion. In 2 cases a thoracostomy was done in an attempt to relieve the pain and dyspnea by draining out the bloody effusion. The other 5 cases comprised a calcified cyst arising from the anterior mediastinum; an osteochondrosarcoma of the 10th rib; an extrapleural xanthoma; a chondromyxoma in the upper right chest, and a retropleural aneurism of the descending thoracic aorta. Two patients died soon after operation, 1 from ruptured aneurism and the other from pulmonary embolism. Of the remaining 6, 2 were living and well 5 years after the operation, and 2 more, 2 years after the operation, while 2 died some months after the operation, including 1 from tumor recurrence.

The importance of careful X-ray investigation of apical chest tumors is pointed out by H. K. Pancoast

(Jour. Amer. Med. Assoc., Nov. 1, 1924), who has observed 4 cases of a type of growth in the apical region which is misleading in its symptoms. It is an infiltrating tumor, either pleural endothelioma or sarcoma, probably of bony origin, producing a symptom-complex of pain in the upper extremity and cervical sympathetic paralysis (contracted pupil, ptosis, enophthalmos and slight facial hemiatrophy) simulating that of many other conditions, such as spinal cord or meningeal tumors, neck tumors, cervical rib and vertebral X-ray examinations of neoplasms. the shoulder alone before the appearance of the eye manifestations may fail to reveal the apical neoplasm; therefore, a wider area should be included in obscure cases, with a careful scrutiny for increased apical density or erosion of the upper ribs or adjacent vertebræ.

A case of chondrosarcoma of the chest wall, involving the upper part of the sternum and the clavicle, and filling the entire right upper chest, is reported by E. G. Beck (Arch. of Surg., Jan., 1924) in illustration of the open method of intrathoracic surgical treatment. Resection of part of the clavicle having been performed, the tumor, containing the 1st, 2d and 3d ribs, and the pectoralis major were enucleated, leaving an open wound 6 inches in diameter and of the depth of the chest cavity. The tissues thus exposed were treated with radium. At the time of writing the right chest was free from growth, the lung had expanded into the upper chest cavity, and the wound had contracted by one-half.

Ström (Acta radiol., Apr. 10, 1924) reports the case of a woman in whom

a clearly outlined circular, non-expansile mass of the size of a small orange in the right hilus was detected by X-ray. Puncture revealed a hard-walled cyst containing yellowish fluid, which was later detached from the pleura and lung by blunt dissection and removed. Recovery followed.

[See also Empyema, Lung, Tuber-culosis.]

CHEYNE-STOKES SYN-DROME.—According to S. Wassermann (Wien. Arch. f. inn. Med., July, 1923), oxygen inhalations may be regarded as a specific in this condition. Narcotics and hypnotics are absolutely contraindicated. Hearttonics and stimulants may be used in conjunction with the oxygen. The patient should not be allowed to remove the oxygen mask in the respiratory phase. In syphilitic cases with Cheyne-Stokes syndrome antisyphilitic treatment is also indicated.

### CHICKEN-POX. See VARICELLA.

CHLOASMA.—The pigmented patches ("liver spots") of chloasma may be temporarily removed by the use of various solutions and peeling pastes. According to Sutton (Ther. and Diet. Age, Dec., 1924), the most satisfactory liquid preparation consists of mercuric chloride, 1 part; alcohol, 25 parts, and water, 74 parts, to be painted on several times a day until desquamation results. A saturated solution of salicylic acid in alcohol is likewise useful, and lactic acid, phenol, a 10 per cent. resorcinol paste, and hydrogen peroxide have also been recommended. The patient should receive a careful general examination to discover, if possible, the exciting cause of the eruption.

CHLORINE.—The subject of chlorine treatment in respiratory diseases has already been briefly presented under Acute Rhinitis (q. v.). In their 2d paper on this subject, E. B. Vedder and H. P. Sawyer (Jour Amer. Med. Assoc., Jan. 31, 1925) have stated their more recent conclusion that sterility of the mucous surfaces following the chlorine inhalation treatment cannot be expected. Nevertheless the clinical results obtained with their gassing chamber have continued about the same as previously reported, the great majority of coryza cases being cured and nearly all of the remainder improved, with similar results in acute bronchitis and improvement in many cases of acute laryngitis, chronic bronchitis and whooping-cough. Tests with corvza cases showed that many bacteria are killed by the inhalations, while the remainder are probably reduced in vitality and virulence. It is estimated that about 2.5 c.c. of pure gaseous chlorine is absorbed in the respiratory tract during a 1-hour treatment. Independently of bactericidal action, chlorine may be a powerful therapeutic agent by its irritant action, which stimulates the flow of lymph, cleansing the mucous surfaces, and causes a local hyperemia which favors diapedesis of phagocytes. The oxidizing action of chlorine may, in addition, stimulate phagocytosis and the production of antibodies.

To obtain satisfactory results, the concentration of chlorine in the air must be maintained for the entire hour of treatment within very narrow limits, all the writers' treatments being given at 0.013 to 0.015 mgm. per liter. As the absorption of chlorine discharged in a room varies enormously with the character of its walls, the number of persons, the air moisture, etc., it has been found necessary to resort to a type of apparatus that will deliver the proper concentration of chlorine constantly and automatically (air blower driven electrically; chlorine generated by electrolysis of HCl by means of 2 dry cells; regulation of current by means of a rheostat, with meter), and to have the patient breathe the air-gas mixture through a funnel-shaped bag of muslin or paper adjusted to his nose and mouth. This fits very loosely, so that the air streams past his face, and rebreathing into the bag is avoided. The practitioner can use this apparatus in his office or can carry it to bed patients. In hospitals, institutions, etc., the room procedure can be employed to treat a

number of patients at one time, but the chlorine in the air is to be determined continuously with a "chlorine detector and analyzer," and adjusted from the outside according to indications.

Cases of hay fever, asthma, pneumonia and tuberculosis are not benefited by the chlorine treatment. A few patients are hypersusceptible to chlorine, and when it proves irritating they should not remain for the full hour. Age presents no contraindication.

Treating 220 patients with chlorine by the Vedder and Sawyer technic, M. F. Jones and C. Garofalo (Arch. of Otolaryng., Jan., 1925) observed 8 cures and 115 cases of improvement. The latter was more marked when the treatment was given on consecutive days. Unfavorable effects were noted in hay fever, asthma, tuberculosis and whooping-cough. The treatment had no alleviating effect on patients with free pus in the nose or nasopharynx. M. B. Patterson (Ibid.) reports a bacteriologic study indicating that chlorine, in the concentration used in treatment, has little effect on the development of bacteria in vitro unless these are exposed for over 90 minutes. This does not preclude its being useful clinically, however, through stimulation of expectoration, coughing and profuse secretion of mucus immediately following the treatment.

F. L. Alloway and C. S. Bucher (III. Med. Jour., Apr., 1925) summarize their experience in the treatment of 200 cases with chlorine administered in a room of 10391/2 cu. ft. A small electric fan on the floor was used to keep the heavy gas moving at a higher plane. The proper amount of gas was liberated in the room at the start, and an equal amount then allowed to seep gradually into the room from the measuring burette during the next 45 minutes, to make up for absorption and other losses. The proper amount is noticeable by the odor and a very slight irritation in the posterior part of the pharynx. Of the 200 cases, 30 are asserted to have been relieved by the 1st treatment, 90 required 2 treatments, and 15, 3 treatments, to obtain relief from coryza symptoms. Five cases of whoopingcough responded favorably after 6 treatments.

In an advanced case of pulmonary tuberculosis, considered practically moribund, F. S. Macy (Med. Jour. and Rec., Sept. 3, 1924) employed a solution of the Carrel-Dakin order as a source of free chlorine for inhalation. A Turkish towel was thoroughly soaked with it and suspended a few inches above the patient's head, a knot in the lower end guarding against a possible drip. This was kept up continuously for about 1 month, during which, beginning on the 3d day, there occurred a striking improvement in the sputum and cough, and improvement in the general condition. After 6 weeks his left lung was declared to have "cleared up" and the right to have greatly improved. The same method was used with encouraging results in cases ranging from simple coryza to graver and more chronic respiratory infections.

CHLOROFORM.—PHYSIO-LOGIC ACTION.—According to experimental work carried out by Nicloux and Yovanovitch (C. r. Soc. de biol., Dec. 12, 1924) in dogs, the presence of chloroform in the peripheral nerves is the most important factor in the anesthesia. Thus, the vagus nerve retained 73 mgm. of chloroform per 100 Gm. of its tissue at the beginning of anesthesia and 166 mgm. when the animal was moribund, while in the case of muscle tissue the corresponding amounts were but 9.3 and 25.1 mgm. The nerve trunks absorbed and retained more of the drug than the centers themselves.

PROPHYLAXIS OF VOMITING.—Post-chloroform vomiting has greatly decreased, as noted by Blondel (Bull. de l'Acad. de méd., Nov. 20, 1923), since pre-operative fasting and purgation have been given up. He allows the patient bread, fresh fruits, water, tea or coffee with little sugar for 3 or 4 days before operation. Milk is disallowed, and stimulation of the liver by excess of proteins, fats or alcohol is guarded against. Sodium citrate or bicarbonate, 8 Gm. (2 drams) in 1 liter (quart) of seltzer water, is given in small amounts in the course of the day. After this form of preparation there is practically no vomiting after chloroform.

Mazzini (Prensa méd., Jan. 10, 1925) stresses the relationship of toxic chloroform effect in fasting animals to lack of glycogen in the liver, and warns that fasting persons should not be given chloroform unless injections of hypertonic glucose solution have been administered and water taken freely.

CHLOROSIS.—Various authors have commented of late on the marked reduction of incidence of

this disease, at least in its more outspoken forms, in the last 20 years. Thus, Deneke (Deut. med. Woch., July 4, 1924) notes that in a Hamburg hospital in 1901 there were 201 cases of chlorosis out of a total of 12,000 admissions, while in 1923 there were but 3 cases in 20,000. He ascribes this diminution to the abandonment of tight lacing, with its prejudicial influence on circulation through the liver and spleen. Rist (Bull. Soc. méd. des hôp. de Paris, Nov. 29, 1923) records a similar experience in France, and argues that the reduced incidence cannot be due to improved nutrition among the laboring classes since there was no increase of chlorosis among underfed populations during the late war.

According to J. M. H. Campbell (Guy's Hosp. Rep., July, 1923) there is good evidence that improved conditions in factory life and domestic service are the main cause of the decrease, greater opportunity being given for fresh air and exercise. Chlorosis is only an exaggeration of a physiologic change which occurs in at least 10 per cent. of girls at puberty. It is probable that chlorosis depends on changes in the ovary: The periods are generally scanty and irregular from the start, suggesting deficient ovarian activity. There is a tendency to increased secretion of HCl in the gastric juice—a condition opposite to that generally existing in other anemias.

N. Fiessinger and M. Bidegaray (Bull. Soc. méd. des hôp. de Paris, Nov. 15, 1923) maintain that the incomplete, mild (frustes) forms of chlorosis are as common as ever, though readily overlooked. A diagnostic point is the ease with which

jugular murmur can be elicited without any special maneuver. In the absence of any anemia, a continuous jugular murmur can be elicited in children and women less than 30 years of age in the standing position by making the cervical fascia tense by tilting the head and making pressure over the vein with the stethoscope. A rapid venous circulation, as in posthemorrhagic anemia, seems to promote these murmurs. chlorosis the murmur is easily detected and is not modified by change of posture. The other symptoms may consist merely of slight pallor of the conjunctivæ, digestive or menstrual disorders, palpitations, etc. The tentative diagnosis is confirmed by the blood, which generally shows 60 to 80 per cent. of hemoglobin and the erythrocytes not much below 3,800,000.

TREATMENT.—The preceding observers note that under rest, a meat diet and iron the jugular murmur is gradually lost as the anemia improves. H. J. Isaacs (III. Med. Jour., Jan., 1924) has reported a severe case in a girl of 20 years, in whom the hemoglobin percentage was 15; erythrocytes, 1,976,000; color index, 0.375, and leukocytes, 3,500. There was marked poikilocytosis and anisocytosis, and a slight relative lymphocytosis. Blood transfusion (100 c.c.) caused a severe reaction with urticaria and marked icterus for 3 days. Blaud's pills were given in a dosage ascending in 6 weeks from 15 grains (1 Gm.) daily to 90 grains (6 Gm.) daily. Daily hypodermic injections of 1/2 to 1 grain (0.03 to 0.06 Gm.) of sodium cacodylate were also given for nearly 1 month. At the end of 7 weeks, the hemoglobin was 88 per cent.; erythrocytes, 5,260,000, and color index, 0.88. Rest in bed with a liberal diet had also been ordered.

CHOLANGITIS. See BILE DUCTS: INFECTION.

CHOLECYSTITIS.—SYMP-TOMS.—A simple classification of cases of cholecystitis on the basis of the symptomatology is advocated by R. E. Weile (Jour.-Lancet, Dec. 1, 1923), who recognizes the following 4 types: Gastrointestinal, hepatic, migraine and "masked." In the 1st type the outstanding symptoms are gas and indigestion, and differentiation from appendicitis or duodenal ulcer may be difficult. In the hepatic type there are attacks of gastric pain, usually close to the right costal margin; pain in the left epigastrium and radiating around the left chest to the back may also be present. In the 3d type there is "sick headache" with vomiting, while in the 4th or masked type the symptoms often bear little apparent relationship to the gall-bladder, and may consist variously of intense headache, neuralgias, chills, fatigue, neurasthenia, high blood-pressure or cardiac disturbances. The pathologic diagnosis is not always based on the gall-bladder itself, for it may be quite normal in appearance though actually the cause of illness. In such cases there are found enlarged duct lymphatics and changes in the liver, consisting of a grayish cast or fine, white interlacing lines on the surface of the organ. Cholecystectomy should not be delayed.

That acute obstructive cholecystitis bears a rather striking analogy to acute appendicitis is pointed out by

I. Morley (Brit. Med. Jour., Mar. 15, 1924). It is due to impaction of a gall-stone in the neck of the gallbladder or in the cystic duct, and its clinical picture is quite different from the other manifestations of gall-Among 100 cases of gallstones. stones the writer found 38 with obstructive cholecystitis. These patients are generally over 50 years of age and stout. A typical attack of biliary colic comes on, but fails to pass off after the usual 2 to 8 hours, and the pain takes on a sharp, stabbing character, localized in the right hypochondrium and increased by deep breathing or coughing. Tenderness and local rigidity develop, and the temperature is generally 100 to 102° F. Vomiting may occur but once, or may be repeated and become bilious. If, with symptoms of threatening gangrene of the gall-bladder, the patient is in a fairly good general condition, early operative intervention is indicated. The performance of cholecystectomy absolutely calls for a clear definition of the cystic duct and its junction with the hepatic duct, as well as of the common bileduct.

Among 13,500 cases of operatively demonstrated gall-bladder disease at the Mayo Clinic, G. B. Eusterman (Ann. of Clin. Med., Mar., 1924) found only 117 cases, chiefly chronic, occurring in children and young adults, these cases constituting only 0.85 per cent. of the total number. The cases were about equally divided between the 2 sexes—a fact supporting the infection theory of acute and chronic calculous and non-calculous cholecystitis. Tonsillar sepsis, appendicitis, rheumatic fever, grippe and influenza played an important part in these cases; typhoid fever relatively infrequent. The histories and seizures were usually typical in the gall-stone cases. chronic cholecystitis, however, the clinical picture was often ill-defined, consisting chiefly, in males, of a mild or asymptomatic gall-bladder history and a rather frequent (30 per cent.) intrinsic gastric complaint, while in young women, frank colic, icterus, or a gastric picture simulating ulcer were infrequent, but flatulent dyspepsia was noted. In recurring upper abdominal complaints in young men, duodenal and gastric lesions should be excluded before seriously considering gall-bladder disease.

DIAGNOSIS .- With reference to the diagnosis of chronic cholecystitis, J. P. Schneider (Minn. Med., Dec., 1923) deems it advantageous to divide the life history of the disease In the 1st and 2d by decades. decades, anamnesis not infrequently elicits an onset of toxic symptoms such as periodic headaches or of reflex digestive symptoms such as fullness and eructations, preceded at an interval of a few weeks or months by a severe sore throat, typhoid fever, pneumonia or acute appendici-In the 3d and 4th decades, vomiting occurs with the indigestion, hypochlorhydria replaces the earlier hyperchlorhydria, and there are dull aches in the gall-bladder region, increasing to gradual attacks of pain with chilliness and slight fever, and finally frank gall-stone colic when a calculus attempts to migrate. In the 4th to the 8th decades there may be increasing pathologic changes and complications such as empyema and gangrene of the gall-bladder, obstruction of the

common duct, pancreatitis, peritonitis, perforation and malignant disease. In the differential diagnosis, the X-ray is of material aid in distinguishing duodenal ulcer. gastric crises of tabes, migraine and angina pectoris should be excluded. Tests for bile in the blood are useful, but studies of gastric secretion yield little that is definite, and the Meltzer-Lyon test is probably of no value. The writer finds it diagnostically advantageous to try to elicit points of tenderness to pressure along the 9th right intercostal nerve, as well as the phrenic reflex on the right side.

The diagnosis of chronic cholecystitis without stone is discussed by F. W. Bancroft (Ann. of Surg., Nov., 1923). These are the cases with a history of attacks of pain and often of vomiting and sour eructations, but without any attacks as severe as those that result from cystic obstruction. At operation there may or may not be found a marked thickening of the gall-bladder wall with numerous adhesions. Among the writer's 38 cases operated on for this condition, the average age was 36 years and 63.2 per cent. were in women. The average duration of symptoms was 2½ years. In 9 the pain was dull and in 29, knife-like. Few appeared very ill, but in 25 there was marked rigidity and in 4, moderate rigidity. There was tenderness in the upper right quadrant in 35. A diagnosis of chronic cholecystitis is justified by a long history of right upper quadrant pain, usually radiating to the back, with tenderness. The Lyon test proved of decided diagnostic aid in 9 cases. In the treatment, operation is justified, and the procedure of

choice is **cholecystectomy**, which gave good results in 88.5 per cent. of the author's 31 cases thus dealt with.

M. Emmert (Neb. State Med. Jour., May, 1924) maintains that gall-bladder disease is always preceded by and associated with hepatitis, and that about 75 per cent. of cases are secondary to appendicitis and 25 per cent. to infections about the head. In 1 of his illustrative cases the "appendicobiliary syndrome" cleared up under appendectomy and diet. In a 2d case, both appendectomy and cholecystectomy were required before recovery occurred. In a 3d case the 2 operations yielded only partial success. Recurrent attacks of jaundice and discomfort point to a persisting hepatitis.

X-ray Diagnosis.—Isolation of stone shadows is no longer the sine qua non of X-ray diagnosis in gall-bladder disease. As noted by F. S. Bissell (Minn. Med., Dec., 1923), the outline of a pathologic gall-bladder becomes visible to a greater or less extent. Usually no preparation other than a 12-hour starvation period is advisable. A series of pictures of varying densities is made with rays of different degrees of penetration, and overdevelopment carefully avoided. A routine gastric examination is then made to exclude ulcer or cancer and seek indirect evidence of gall-bladder disease. Certain reflex signs occur in many instances, viz., prolonged evacuation time, gastric spasticity and pyloric insufficiency. D. Palmer (Amer. Jour. of Roentgenol., Nov., 1923) states that differentiation of the gall-bladder shadow from a corset-lobed liver or dilated duodenum often requires correlation of the gastrointestinal report. Indirect evidence is afforded by changes in contour of the gastric antrum, bulb, duodenum and hepatic flexure, due to pressure or a localized peritonitis.

Out of 89 cases operated on after the writer had passed an opinion on them from the X-ray evidence, 81 proved to have been correctly interpreted.

Much interest has been aroused by the procedure devised by E. A. Graham and W. H. Cole (Jour. Amer. Med. Assoc., Feb. 23, 1924) to visualize the gall-bladder in Xray examination by intravenous injection of an opaque compound which is largely excreted into the gall-bladder with the bile. To this method the term cholecystography has been applied. In a later communication (Ibid., Jan. 3, 1925) these observers, with G. H. Copher, allude to the sodium salt of tetrabromphenolphthalein as the most satisfactory compound for the purpose. To visualize the gall-bladder in the human subject, 4.5 or 5 Gm. of this compound are dissolved in 35 to 40 c.c. of freshly distilled water, filtered, and sterilized by heating in a boiling water bath for 15 or 20 minutes. In persons weighing less than 125 pounds the dose should be less. The solution is given intravenously with a syringe in 2 doses, 1/2 hour apart, before breakfast between 7.30 and 9 A.M. Extravasation of the solution should be guarded against. Breakfast must be omitted, as well as lunch, though for the latter a glass of milk may be Protein should be omitted from the evening meal. While awake the patient takes 2 Gm. (30 grains) of sodium bicarbonate every 3 hours for 48 hours. He may drink water, and should lie on the right side of the abdomen. Roentgenograms are taken 4, 8, 24 and 32 hours after injection. Of the last 55 patients injected, 13 had transient dizziness or

nausea and vomiting, including 4 with body pains and fall in blood-pressure, promptly relieved by 0.5 to 1 c.c. (8 to 16 minims) of adrenalin intramuscularly. With this procedure the writers have been able to make a correct diagnosis in 95 per cent. of cases of verified cholecystitis, with or without stones. The method proved accurate even in very early cholecystitis.

Requirements for proper visualization of the gall-bladder, according to Graham, Cole and Copher (Ann. of Surg., Sept., 1924) are: A sufficient secretory capacity of the liver, an open cystic duct, and an unimpaired concentrating function of the gallbladder. The best shadows are obtained with normal gall-bladders. Failure to obtain any shadow almost certainly denotes a serious lesion of the biliary tract. In 4 such cases, operation revealed definite cholecystitis. The same observers (Jour. Amer. Med. Assoc., May 31, 1924) state that the normal gall-bladder begins to cast a shadow 31/2 to 5 hours after the injection, casts the heaviest shadow between 16 and 24 hours, and empties in about 48 hours. The 4- or 8-hour shadow is nearly always larger than the later ones. A gall-bladder which fails to show this "distensibility" is pathologic. When the cystic duct is not occluded, gall-stones appear as positive or negative shadows.

R. D. Carman and V. S. Counseller (Amer. Jour. of Roentgenol., Nov., 1924) state that in 39 cases which came to operation after being subjected to the *Graham test* (above described), all had cholecystic disease. Of 25 who had gall-stones, the gall-bladder had failed to fill in 19. Of the patients not subjected to operation, less than ½ responded normally to the test—a fact pointing to the extraordinary frequency of gall-bladder disease.

According to L. R. Whitaker and G. Milliken (Surg., Gyn. and Obst., Jan., 1925), sodium tetraiodophenolphthalein has definite advantages in cholecystography over the analogous bromine salt used by Graham. It is nearly

twice as opaque to the X-rays, and only about ½ as much of it is required to secure a gall-bladder shadow. Animal experiment indicated no appreciable difference in toxicity of the 2 drugs, and this was confirmed in a clinical test; 0.05 Gm. per kilo. of the iodine salt caused much less in the way of symptoms than 0.09 Gm. of the bromine salt, yet yielded a deeper gall-bladder shadow.

Duodenal Intubation.—According to B. B. V. Lyon (Ther. Gaz., Nov., 1924), non-surgical drainage of the gall-tract permits of accurately diagnosing catarrhal, inflammatory, infected or adhesive states of the gall-bladder and of the common or cystic ducts. When added to the accepted methods of dietetic and chemical therapy, it is the most practical preliminary step which may lead up to the prevention of gall-stones or late gall-tract pathology, due to its ability to recognize these conditions in their incipiency.

Non-surgical drainage for diagnostic purposes was performed by B. F. Scaiefe (Ann. of Surg., Nov., 1923) in 22 cases of gall-bladder disease. Of 14 cases operated on, a diagnosis of chronic cholecystitis had been made in 9, all of which were verified by the operator and the pathologist. While the test is not of the utmost importance in diagnosis, considerable information can be gained from its use.

According to H. M. Armitage (Ther. Gaz., Nov., 1924), however, the conclusions arrived at by the nonsurgical drainage method are only very general in the diagnosis of chronic cholecystitis. He quotes Hartman, in studies at the Mayo Clinic, as having shown the difficulty of obtaining uncontaminated samples of bile on account of inability to sterilize the stomach, duodenum or mouth. Only

in acute cholecystitis or in exacerbations of chronic cholecystitis are the bacteria present in the bile. The writer prefers a clinical diagnosis based on: (1) Early satiety of food; (2) intolerance of food which formerly agreed; (3) accumulation of gas, belching and sour regurgitation occurring in 15 to 30 minutes after ingestion of food; (4) sudden acute nausea and vomiting. If localized tenderness coexists, the diagnosis of cholecystitis is certain.

Albuminocholia, elicited by duodenal intubation, is deemed of diagnostic import by F. Raue (Klin. Woch., Apr. 16, 1923). Duodenal fluid is obtained with the sound, and the mucin removed with acetic acid. Esbach's reagent is then used, and with the normal specimen yields no precipitate or only a very slight one, as coagulable albumin is not present in normal duodenal juice. In catarrhal jaundice there is less mucin than usual, but marked precipitation with Esbach's reagent occurs. In gall-stones and cholecystitis without obstruction much mucin is precipitated, while the albumin precipitate, although variable, is often diagnostically useful. Its presence in a doubtful case points to cholecystitis as against duodenal ulcer or nephrolithiasis, and to congestion of the liver rather than cirrhosis.

[See also BILE and GALL-TRACT, NON-SURGICAL DRAINAGE OF.]

TREATMENT.—In respect of the medical treatment of gall-bladder lesions, M. Einhorn (N. Y. Med. Jour., June 6, 1923) deems frequent meals, the drinking of much water and hygienic living all of importance. The diet, while it should not be rich, should not be so rigorous as to be weakening. Instillation of various drugs, such as argyrol, ichthyol or

mercurochrome into the duodenum is advantageous. The drinking of Carlsbad water, or the like, seems beneficial, and glycerin in teaspoonful doses before meals is often useful. Phenyl salicylate and hexamethylenamin are also of advantage. Lyon uses magnesium sulphate instillations into the duodenum, followed by drainage of the contents.

A. Bassler (Ther. Gaz., Apr., 1923) emphasizes the need of treating possible etiologic factors. The gallbladder may be infected through the portal stream or from the duodenum. Any generalized infection with an organism of the typhoid-coli-dysentery group or streptococci or staphylococci can infect the bile stream. Deficient bactericidal function of the liver and chronic biologic errors (intestinal infections or toxemias of symptomless and chronic types) comprise the most important factor in gall-bladder disease. These call for bacterial and dietetic measures. In gastroduodenal catarrhs the gallbladder symptoms can be held in abeyance by proper lavages, diet and medication. Not a few cases benefit as well at Saratoga or Bedford Springs as abroad. An important feature is a constant high specific gravity of the bile, due largely to insufficient exercise and life out-ofdoors. The automobile is responsible for more gall-bladder troubles than any factor except infection. subject should walk several miles a day, or the exercise be obtained in a gymnasium or by work with a physical instructor. While the opiates are best in acute sharp pain, the low steady growl with epigastric hyperesthesia can be benefited by alternate heat and cold, e.g., by use

of live steam from the Kommeral steam pot for a few minutes, and then cold, this being alternated over a 20-minute period once or twice a day. Alternate mustard plasters and ice-bags can accomplish this fairly well. The remedial preparations from which the largest number of patients have claimed benefit, in the writer's experience, are:

(A)

B. Sodii oleatis,

Sodii salicylatis. āā 4.5 Gm. (gr. 1xviij);

Phenolphthaleini . 1 Gm. (gr. xv);

Mentholis ...... 0.35 Gm. (gr. v).

Ft. pil. No. L.

Sig.: Take two on arising and retiring, followed by a tumblerful of warm water.

(2)
Glycerini,
Tr. cardamomi
comp. ......āā 45 c.c. (fʒiss).

M. Sig.: Dissolve one powder in ½ tumbler of water, and when well mixed add a teaspoonful of the mixture. Take this about 15 minutes after each meal.

(C)
Nightly doses of sodium succinate, 1 Gm.
(15 grains), or its use after meals.

In treating early cases of subacute cholecystitis, W. Bain (Pract.. Nov., 1924) gives immediate attention to any septic focus that can be found and aims to ameliorate any existing digestive disturbance by a restricted diet for at least 10 days. If there is flatulent distention or salines have alone been taken for months, a few intestinal douches on alternate days are ordered. On the intervening days mustard-bran liver packs are applied, and these are continued every 2d day

until the gall-bladder tenderness disappears. A satisfactory daily bowel evacuation must be secured, if necessary by aloes or phenolphthalein before dinner and a saline in the morning. To prevent biliary stasis, 1 to 2 drams (4 to 8 Gm.) of magnesium sulphate is ordered taken in a small quantity of strong sulphur water, or in plain water when at home, twice a week 1 hour before breakfast. Frequently, 1 pint (500 c.c.) of strong sulphur water is prescribed daily; likewise a cachet containing hexamethylenamin, iridin, euonymin, colalin and leptandrin. If hexamethylenamin irritates the bladder, sodium salicylate or sodium benzoate may be substituted. If there be hypochlorhydria, dilute hydrochloric acid is indicated. Pleasurable forms of exercise, such as riding, curling, golf and bowling are highly desirable, but fatigue and chill should be avoided.

In cholecystitis, cholelithiasis and cholangitis, R. Decker (Münch. med. Woch., July 18, 1924) reports favorable effects from choleval, a colloidal silver salt containing 10 per cent. of silver with sodium cholate as protective colloid. It occurs as a dark brown, odorless powder, easily soluble in water, and is supplied in tubes each containing 0.1 or 0.2 Gm. of the product. Either dose is dissolved in 10 c.c. of water and given intravenously. The smaller dose is usually sufficient. The patient should be in bed, as a slight chill may occur a few hours after the injection. Very good effects were noted in all instances; the usual attacks of biliary colic no longer recurred, inflammatory conditions in the gall-bladder soon disappeared, and fever, if present, subsided. Benefit sometimes followed even the 1st injection, but to maintain the results 4 or 5 further injections on alternate days should be given after subsidence of the symptoms. The drug is regarded as exerting an antiseptic action on the infected bile and gall-bladder mucosa, and also a cholagogue action.

J. Aimard (Jour. de rad. et d'électr., May, 1923) deems diathermy very effective in subacute or chronic cholecystitis, with or without calculi. Pain is largely or wholly relieved in these patients, as well as in cases with adhesions or spasm. The electrodes measure 22 x 14 cm., are made of tin, and are firmly held, 1 over the gall-bladder and the other over the back. Thirty-minute treatments are given on successive or alternate days.

[See also Cholelithiasis and Gall-tract, Non-surgical Drainage of.]

SURGICAL TREATMENT. -Among 580 cases of biliary tract disease operated on at the Johns Hopkins Hospital between 1889 and 1924, 72 per cent., according to A. Blalock (Jour. Amer. Med. Assoc., Dec. 27, 1924), were cured, 11 per cent. improved, and 6 per cent. unimproved. The mortality immediately following operation was 9.5 per cent., the highest percentage—24—falling in the group with stones in the common duct. The gall-bladder was removed in 49 per cent. and drained in 51 per cent. The deaths and the percentage of recurrence of symptoms were much higher after drainage than after cholecystectomy. latter procedure is therefore preferable, provided the patient's condition is such that the extra time under anesthesia will not too greatly lessen his chances of recovery.

According to J. B. Deaver (Ann. of Surg., May, 1924), the evidence shows that the function of the gall-bladder is not a very important one, and experience indicates that chole-cystostomy is a conservative operation mainly in that it conserves the gall-bladder for probable future trouble. The most frequent cause of recurrence after cholecystectomy is adhesions, and the most serious

cause in reoperated cases is persistent chronic infection involving the pancreas. Adhesions cannot always be prevented, even with the most careful technic. Chronic pancreatitis is usually a preoperative condition and can be avoided in most instances by early attention to symptoms of gall-bladder disease. In the absence of the gall-bladder, drainage through the common duct affords relief from and often cure of the pancreatic condition.

A. S. Lobingier (Cal. State Jour. of Med., Feb., 1924) urges that only a very small part of the infected biletract is treated when cholecystectomy is performed or stones removed from the gall-bladder and ducts, the more important infected liver and hepatic ducts receiving little or no attention. Cholecystectomy is always required in pericholecystitis with adhesions and necrotic edema, but in cholecystwith or without stone, in cholangitis and hepatitis, and in splanchnic paresis with failing myocardium—the usual concomitants of infection,-prolonged drainage is advocated. The writer first removes the greater portion of the gall-bladder, but leaves in enough of its neck to tie in securely a small, firm-walled drain in the cystic duct. This is left in place at least 20 days, and if necessary, 6 weeks or 2 months. In the operation the gall-bladder is clamped off and cut 11/2 inches from the common duct. The tube is tied in with 2 purse-string sutures of 20day chromic gut, and its end is inserted to a point 1/2 inch short of the common duct. The raw edge may be covered in with omentum or the serous coat turned in as in cholecystotomy. When the gallbladder is acutely septic, a temporary Penrose drain is placed under the liver above the right kidney, to be withdrawn a few days later. The procedure described combines the advantages of cholecystectomy and cholecystotomy, draining and reducing infection in the liver and pancreas.

Prompt cholecystectomy without drainage in the acute stage of cholecystitis is advocated by A. Chalier (Lyon. chir., Jan.-Feb., 1924), who reports 2 cases satisfactorily dealt with in this way. The procedure is permissible where the gall-bladder can be removed entire, without escape of contents, and proper ligation, hemostasis and a dry operative field are obtainable. It is advantageous in the prompt recovery secured, the forestalling of adhesions, and the avoidance of weakening of the abdominal wall, being analogous to prompt appendectomy in acute appendicitis. Drainage is, on the other hand, required in feeble patients or where adhesions, abscesses or other special conditions are present.

From experience in 20 cholecystectomies, H. Simon (Zent. f. Chir., Mar. 3, 1923) recommends a simple *median incision* above the umbilicus, without incision or division of the rectus sheath. Such an incision has numerous advantages, and his results have been good.

Experiments in dogs in Eiselsberg's clinic showed, according to L. Schönbauer (Arch. f. klin. Chir., Aug. 29, 1924), that trypsin in the bile, in conjunction with obstruction of a biliary duct, can induce gangrenous cholecystitis in the absence of infection. Clinical observation also supported this. Therefore, in gangrenous cholecystitis, as well as in bile peritonitis without perforation, immediate cholecystectomy is indicated, irrespective of the presence of calculi.

R. E. Weible (Surg., Gyn. and Obst., Jan., 1925) calls attention to the visible changes in the liver in the region of the gall-bladder, noticeable in many instances (27 out of 46 cases) of chronic cholecystitis. They are either dull gray patches, often of considerable size, or milky white lines of varying length, breadth, prominence and pattern. These lines represent inflammatory changes of the lymphatics, carried from the gall-bladder to the liver, sometimes with secondary fibrous deposit and contraction, producing the picture of cirrhosis. Sections beneath them always show hepatitis. Even in the absence of all other signs of gall-bladder inflammation, these visible changes in the liver, however slight, can be relied on for the diagnosis of chronic cholecystitis and are an important indication for cholecystectomy.

[See also GALL-BLADDER: SURGERY.]

# CHOLELITHIASIS.—ETIOL-OGY.—In refutation of the teaching of Naunyn and others that the gallbladder must be infected before

stones can develop in it, T. Rovsing (Acta chir. scand., lvi, 103 and 207, 1923) states that, among 530 operated cases of gall-stones in which a bacteriologic examination was made under aseptic precautions at the time of operation, the gall-bladder contents were found sterile in 314 cases and infected in 216. In no case with sterile bile could germs be found in the stones, and in but 1 of the 530 cases was it impossible to demonstrate a core of pigment in the stones. The beginning of gall-stones seems to lie in a small nucleus of pigment, and sepsis is merely a sequel, not a cause. The core of a gall-stone is always, or nearly always, formed in the intra-hepatic biliary passages by the precipitation of black pigment chalk, the process being determined

by a transitory "diathesis" comparable with the precipitation of uric acid, its salts, and calcium oxalate in the kidneys. Neither gastrocoloptosis nor prolonged biliary stasis with jaundice seems to promote gall-stone formation.

Drury, McMaster and Rous (Jour. of Exp. Med., Mar., 1924) conclude from experimental work that cholesterol precipitation out of human bladder bile can be induced or prevented by slightly altering the reaction of the fluid toward the alkaline and acid sides, respectively. The same writers (*Ibid.*, Jan., 1924) found reason to believe that the development of carbonate stones may result, not from changes in the bile caused by germs, but from inflammation such as leads to lessened motility of the duct system with accumulation of organic débris.

H. Toxopeus (Ned. Tijd. v. Gen., Dec. 13, 1924) notes that in men gallstones occur most often after the 75th year; in women, soon after the 40th year. All conditions known to favor gall-stones are such as hamper the respiratory excursions of the diaphragm. Such causes include the high intra-abdominal pressure of pregnancy, low position and immobility of the diaphragm due to labor, the wearing of corsets and tight clothing, sedentary habits, and superficial breathing because of protracted illness. The diaphragm presses the blood and bile out of the liver, as a hand squeezes a sponge, and costo-abdominal breathing therefore tends to obviate conditions that permit gall-stone formation.

According to B. Soler (Siglo med., Jan. 27, 1923), pregnancy favors gall-stones through excessive cholesterin content of the blood, overwork by the liver, and endocrin disturbance—the latter usually a hypothyroid state

with changes in the ovaries. Chronic constipation, frequently attended with defective thyroid functioning, is an important factor in gall-stone development.

DIAGNOSIS.—According to F. Ramond (Presse méd., June 18, 1924), the following features are useful in the differentiation of digestive disturbance due to gall-stones from that due to other causes: (1) Pain more variable in intensity and time of appearance than in gastric ulcer; (2) appetite normal or exaggerated; (3) aërophagia commonly present; (4) gastric catarrh, resembling the alcoholic variety, sometimes present; (5) nausea; (6) facial congestion, drowsiness, and cold hands and feet after meals; (7) constipation; (8) mucomembranous enteritis. from the uncomfortable feeling of constriction at the waist and the typical gall-stone pain, which may radiate to the left chest and lead to anginal attacks, there may also be cough, either spontaneous or brought on by pressure over the gall-bladder; reduction of breath sounds at the right base, often differentiating gall-stones from duodenal ulcer, and vertigo, present much oftener in gall-stones than in stomach disorders. The presence of urticaria, pruritus, acne or seborrhea may point to gall-stones rather than other disorders in the infrahepatic region. The response to drugs and diet is also of significance, gastric ulcer being more allayed by alkalies or a lactovegetarian diet, while in gall-stones exclusion of eggs and marked reduction of fats generally bring much relief, and roasted or grilled meats are usually well borne.

Some *minor reflex manifestations* helpful in distinguishing gall-stone

attacks from gastrointestinal disturbances are enumerated by J. C. M. Fournier (Bull. Soc. méd. des hôp. de Paris, Dec. 25, 1924) thus: (1) Numbness in the right arm, independently of pain in the upper right quadrant; (2) a like numbness or paresis of the right arm following hepatic colic; (3) neuralgic pains in the right arm, which may be relieved by hot applications over the liver much better than by similar applications over the arm itself; (4) incidence of the attacks after the jolting experienced in motoring, riding horseback, or bicycling; (5) incidence of attacks as a result of cold, e.g., upon ingestion of cold drinks or cold bathing, in a person able to eat much food with impunity.

The value of the skin sign of gallbladder disease is emphasized by E. M. Livingston (Jour. Amer. Med. Assoc., May 10, 1924). It consists of cutaneous hyperesthesia localized approximately within a 2-inch radius from the tip of the 9th costal cartilage and maximal at that point. The method of testing consists of a vigorous twisting pinch, sufficiently strong to be unpleasant even on normal skin, and, by careful comparison of all the abdominal quadrants, to determine areas of hyperesthesia, where the same intensity of pinch becomes painful. Hot and cold test-tubes may be used as an aid in delimiting more exactly the involved zone. Of 22 operated cases of acute cholelithiasis or acute cholecystitis subjected to this test, all but 2 were positive, and in these 2 there were reasons for the failure. This test proved as constant and valuable as any other sign or symptom of the disease, as shown by the fact that of

31 operative cases of acute biliary disease, characteristic pain was noted in but 19; gaseous eructations, 9; vomiting, 24; constipation, 7; jaundice, 13; typical tenderness, 13; rigidity, 19; a mass, 8; positive X-ray findings, 9, and positive skin test, 20. If, in biliary colic, the skin sign is negative or is present elsewhere, the condition is not a simple acute disease of the gall-bladder.

The procedure in eliciting diminution of breath sounds at the right base as an evidence of gall-bladder disease is described by Ramond, Jacquelin and Borrien (Tribune méd., Nov., 1924). The ear is placed in the posterior axillary line, a little below the angle of the scapula, and the patient made to breathe at first very gently, then more amply, and finally deeply. The opposite side is then ausculted similarly. To be of significance, the procedure should elicit a distinct difference between the 2 sides, as there is, as a rule, normally a slight excess of breath sounds on the left side. This sign, which the writers found present in 9 cases out of 10, is most pronounced during the acute attack, yet subsides only gradually thereafter. In many instances it could still be elicited months and even years after an attack of colic. It may thus be of retrospective as well as prognostic significance. It seems to be a specific evidence of irritation of the biliary tract, however produced.

K. Westphal (Zeit. f. klin. Med., Jan. 27, 1923), similarly, observed with the X-ray a marked restriction of the movements of the right side of the diaphragm in many cases of hepatic colic. He also calls attention to a sensory reflex consisting of sensitiveness of the right phrenic nerve in the neck, which was elicited in 15 out of 25 cases.

Duodenal Intubation.—In atypical cases of gall-bladder disease, M. Einhorn (Med. Jour. and Rec., July 2 and 16, 1924) finds direct examina-

tion of the bile, obtained with the duodenal tube, diagnostically suggestive. The tube must be clean and aseptic, and the bile specimen is to be examined within ½ hour. Pathologic bile is always turbid and subject to manifold variations in color. A yellow-greenish peasoup appearance is frequent in the severer gallbladder affections. If there is no sediment, the lowest layer after centrifugation is examined microscopically. If very numerous, cholesterin crystals are significant. The presence of bacteria in great numbers, almost forming colonies, is an important finding. Heaps of large cholesterin crystals suggest calculi. Not infrequently there are blackish, brownish or reddish, sandlike particles, consisting of roundish "bunchberry" crystals, small black crystals of rhomboid shape, calcium bilirubin and small cholesterin crystals, bile salts and amorphous material. While these sandlike particles do not always indicate stones, they point to a pathologic gall-bladder. The writer gives 3 case histories in support of the statement that, even if no calculi can be palpated at laparotomy, cholecystectomy is necessary if the symptoms and bile examination evidence distinct pathologic findings.

According to C. M. Jones (Arch. of Int. Med., July, 1924), the attempted segregation of different samples of bile (by Meltzer-Lyon biliary drainage) and the localization therefrom of biliary pathologic changes by attention to color, bacteriology or cellular elements in the bile has not proved logical or susceptible of proof. On the other hand, the finding of abnormal crystals in the duodenal contents is of diagnostic significance, as shown in the writer's studies on 274 patients. In his procedure the position of the tip of the tube is checked by fluoroscope, 60 c.c. of warm 33 per cent. magnesium sulphate solution instilled into the duodenum, and passive siphonage begun at once and continued for 1/2 hour. duodenal contents are well mixed and centrifugated at once at high speed for 15 minutes, and the sediment then examined. Of 76 patients with abnormal sediments, 67 could be shown to have had biliary involvement. these 67, 47 showed abnormal amounts of bile-stained epithelium and leukocytes; 40, abnormal amounts of precipitated bile pigment crystals, and 18, cholesterin crystals. Of 57 cases of cholelithiasis, practically all showed abnormal amounts of the crystalline elements contained in gall-stones; about 1/3 also showed many bile-stained cells as evidence of biliary tract inflammation. These findings are deemed diagnostically characteristic in cholelithiasis.

Cholelithiasis

X-ray Diagnosis.—Reporting on X-ray and operative findings in cholecystic disease at the Mayo Clinic, R. D. Carman, W. C. Mac-Carty and J. D. Camp (Radiol., Feb., 1924) note that among 241 operated cases with a negative X-ray diagnosis, the latter was correct in 17.4 per cent., as 199 were found pathologic at operation. Among 169 cases with a positive X-ray diagnosis of pathologic gall-bladder, this diagnosis was correct in 97 per cent. Gall-stones were found at operation in 226 cases, of which 87 had been diagnosed by the X-ray; thus, 38.4 per cent. of gall-stones had been detected before operation by X-ray. In the aggregate, a positive X-ray diagnosis is highly reliable, but a negative report is of no value.

As stated by L. J. Menville (New Orl. Med. and Surg. Jour., June, 1924), the absorption of the X-rays by calculi, and consequently the depth of the shadow they produce, is proportional to the cube of the atomic number of the substance, multiplied by its density. Thus, a cholesterin stone has an absorbability rate of 98; a calcium bilirubin stone, 298, and a urinary calcium phosphate stone, 543. Hence the usual greater visibility of urinary calculi as compared to gall-stones.

[See also BILE and CHOLECYSTITIS: DIAGNOSIS.]

TREATMENT.—As regards medicinal measures, A. Théohari (Arch. des mal. de l'app. dig., Oct., 1923), having found anacidity or subacidity in 89 per cent. of cases of gall-stones, administers twice daily 200 c.c. (7 ounces) of a warm solution containing 1.2 per cent. of table salt and 0.6 per cent. sodium bicarbonate. This is calculated not only to improve gastric secretion but also to fluidify the bile.

An hour's rest after lunch, with a hot application to the abdomen, is prescribed by Schlayer (Wratsch, Feb. 15, 1923) in chronic gall-bladder disorders. All procedures that shake the body, such as motoring, stair-climbing, coughing, etc., are to be avoided. Fever, even slight, calls for rest in bed. The diet must be bland at first, and this should later be resumed at the least indication of recurrence, such as inability to take a deep breath without discomfort. Cold foods and beverages, potato salad, fresh bread, hard cheeses and strong coffee are to be avoided. Fresh foods cooked in butter are not permissible, but butter alone and cream need not be forbidden. Soft vegetables and fruits may be taken, but protein foods should be cut down for a considerable time. Of the drugs, belladonna and hyoscyamus may be given in suppositories for some months, with good results. If a distinct inflammatory process coexists, pantopon and papaverine are also given by the mouth. Extract of orange peel, 1 to 2 teaspoonfuls in sweetened water 3 times a day, is serviceable to exert a mild cholagogue action. Natural and artificial Carlsbad salts act best in mild attacks of colic due to the presence of small stones in the cystic duct; otherwise they are useful only in the intervals between attacks, and they should not be pushed just after an cholecystitis. Drinking acute glass of hot water containing sodium chloride on the empty stomach is a satisfactory substitute for the use of Carlsbad salts. If activation of the bowels is indicated, strong cathartics should not be used, but small doses of magnesium sulphate or liquid paraffin given in conjunction with foods such as fruit compotes and green vegetables. When a tendency to hepatic congestion appears, mineral water may be given in the morning and some cholagogue drug later; if congestion is very marked, sesame or olive oil in a single large dose may be ordered. If duodenal ulcer in addition is suspected, a tablespoonful of 1 of these oils before each meal is very helpful.

The metabolic diathesis favoring gall-stones is best controlled, according to F. Umber (Deut. med. Woch., Dec. 19, 1924), by restriction of cream, butter and egg yolks, a diet

of vegetables, fruit and lean meat, plenty of outdoor exercise and proper regulation of the bowels. Relief of local spasms is effected with suppositories of atropine and papaverine and the use of heat, either in the form of hot mineral waters by the mouth, linseed or Carlsbad mud compresses over the liver, or hot enemas. Daily ingestion of 2 to 3 Gm. (30 to 45 grains) of sodium salicylate or 1.5 Gm. (23 grains) of hexamethylenamin may be recommended when the mechanism of the biliary tract is not disturbed, but is not indicated in an acute attack. The latter is sometimes better relieved by 0.001 Gm. (1/65 grain) of atropine hypodermically than by morphine. In protracted, severe colic Laewen's procedure of injecting 10 to 20 c.c.  $(2\frac{1}{2}$  to 5 drams) of procaine solution just to the right of the 9th spinous process, to block the 10th intercostal nerve, may be availed of. In cases of cholangitis, acute or chronic, simple or calculous, the writer had good results with duodenal instillations of 10 to 50 c.c.  $(2\frac{1}{2}$  to  $12\frac{1}{2}$  drams) of 30 per cent. magnesium sulphate solution, daily or several times a week.

B. B. V. Lyon (Therap. Gaz., Dec., 1924) emphasizes the avoidance of meal skipping and of fantastic food fancies to combat obesity as factors in the prophylaxis of gall-stones. In the established disease, dietetic measures should be taken, viz., frequent and small feedings, with a reduced fat and animal protein content, until improvement takes place. Surgical procedures merely remove the endproducts of gall-tract disease, and not the disease itself; other factors,

such as disease within the liver, the bile ducts, the pancreas and the gut, may still exist after surgery, but can be successfully managed by addition of non-surgical drainage of the biliary system, which includes the pancreas. With this treatment, besides keeping the ducts freely open, any residual catarrh or infection can be drained and cholangitis and hepatitis prevented. Again, the poisonous element in the bile recovered is removed before it can be reabsorbed from the bowel, thus lifting off some of the toxic load from the tired liver. Intermittent drainage once to thrice a week will accomplish much. In the highly toxic case, continuous drainage for 3 or 4 weeks will often bring marvelous results. Autogenous multiplestrain vaccines combined from various sources (teeth, tonsils, sinuses, bronchial tree, bile, colon) are indicated to raise general immunity. Colonic irrigations, given by an expert, twice to thrice a week for a month or 2 are of added aid in detoxication. The patient should be educated to readjust his life as indicated, e.g., by rest, physical exercise, hygiene, vacation periods and, in certain cases, abdominal support and physical therapy.

The indications for surgical treatment, from the internist's standpoint, are formulated thus by Einhorn (Med. Jour. and Rec., July 16, 1924): (1) Severe abdominal colic due to gall-bladder lesion, accompanied by temperature, leukocytosis and a high polymorphonuclear count. (2) Severe biliary colic, requiring morphine injections, accompanied by chills and fever, or occurring frequently so that there is danger of

morphine habit. (3) Whenever empyema of the gall-bladder is suspected. (4) When malignancy cannot readily be eliminated.

Rehfuss (South. Med. Jour., Feb., 1923) remarks that in many instances the medical man makes the gall-stone patient entirely comfortable, and for years often succeeds in rendering a case immune to further attacks which are unquestionably those of infection of the gall-bladder. The surgeon merely operates on the end-product of the forces producing gall-bladder disease, and there is urgent need for post-operative treatment in gall-bladder cases, just as in the post-operative ulcer cure.

The importance of recognition of diathetic factor (cholesterol metabolism) in the treatment of cholelithiasis both before and after operation is urged by A. O. Wilensky (Med. Jour. and Rec., May 7, 1924). In some cases of gall-stones there is a primary disturbance of cholesterol metabolism, leading to precipitation of stones and finding its inception most often during pregnancy. The cholesterol content of the blood and bile can be influenced by diet, but the pathologic changes in the gall-bladder, bile passages, liver and associated organs require surgical measures. Cholecystectomy removes a local focus of infection, but if the infection has spread beyond the gall-bladder a complete cure follows only when efficient drainage is carried out. To obtain any effect on the abnormal metabolic activities themselves, bile drainage is required, either by leaving the stump of the cystic duct open, or better, by making an additional opening into the common or hepatic ducts. Cholecystostomy is inferior to cholecystectomy for

draining the infected area, but through the concomitant bile drainage it permits of better removal of the abnormal metabolic end-products. To control a focus of infection in the intrahepatic biliary apparatus, however, the drainage must be continued for many months. proper operation and intelligent bile drainage according to indications in the individual case, the patient is restored to the condition which existed before no hypercholesterolemic crisis and no biliary infection had occurred. Any repetition of the cause, especially pregnancy, threatens a new hypercholesterolemia, which is usually controllable, however, by rigid attention to the diet, excluding all lipoid bodies.

According to A. Krogius (Finska läk. handl., Aug., 1924), early operation is indicated in a hyperacute attack of biliary colic with dangerous complications even when it is the 1st attack. In cases with a history of several attacks, especially when there have been evidences of inflammation, and if the patient is young and otherwise healthy, operation during an interval is advisable. This applies also to hydrops of the gall-bladder. When attacks of biliary colic are attended with persistent obstructive jaundice, prompt intervention is also indicated. In elderly or weak patients, however, the indications and risks should be carefully weighed before deciding on operation.

Among 167 gall-stone cases subjected to cholecystectomy (18 in males) since 1905, the operative mortality was 9.5 per cent. In the 113 cases without obstructive jaundice, however, the mortality was but 2.6 per cent., while in the 54

cases with jaundice it was 24 per cent. Of 103 patients traced to date, 71 had remained free of symptoms; 15 had occasional slight attacks of pain; 11 had relatively severe pain and other symptoms without jaundice, and 4 had actual recurrences of gall-stone colic and jaundice.

The so-called ideal cholecystectomy, i.e., cholecystectomy followed by closure of the wound without drainage, is considered indicated by F. von Hofmeister (Münch. med. Woch., Dec. 21, 1923) in about 50 per cent. of cases of gall-stones. Very careful surgical work is, however, required for the purpose. In but 1 of the writer's 117 cases was he obliged to reopen and institute drainage secondarily. In 112 cases the appendix was also removed. The method spares the patients the marked discomforts of drainage after cholecystectomy. The contraindications to it include stone in the common duct, abscesses, or recent peritonitis in the vicinity of the gallbladder.

In the cases in which there is a possibility that stones have been left at operation, on account of a thick lower end of the bile-duct with a narrow lumen, Haberer (Arch. f. klin. Chir., Feb. 10, 1923) makes a side-to-side anastomosis of the common duct with the upper duodenum (choledochoduodenostomy), with uniformly satisfactory results.

[See also Gall-tract, Non-surgical Drainage of, and Cholecystitis: Treatment.]

CHOLERA ASIATICA.—DIAGNOSIS.—According to G. C. Maitra and J. B. Basu (Calcutta Med. Jour., Nov., 1924), ordinary agar of pH 7.6 to which has been added 0.5 per cent. of sodium taurocholate constitutes a useful and simple medium upon which to cultivate the cholera germ by direct plating,

either from the stool or from a peptone water culture.

The polyserum method of detecting the cholera germ for rapid diagnosis is lauded by I. Iacono (Rif. med., Feb. 5, 1923). In 22 practical trials of the procedure it proved reliable and yielded the germ in pure culture in 8 hours. It is based on the finding of Castellani that mixed agglutinating serums added to culture media prevent development of the corresponding germs only. Thus, if loops of typhoid, paratyphoid and cholera germs are added to a medium containing only typhoid and paratyphoid serums, only the cholera germs will proliferate.

PROPHYLAXIS. — P. Peverelli (Ned. Tijd. v. Gen., Aug. 2, 1924) quotes 9 writers who have recorded favorable experiences with Besredka's method of vaccination by mouth against typhoid fever, dysentery and cholera. His experiments showed combined administration of a bile pill and living or killed cholera germs per orem in rabbits yielded an immunity such that an otherwise fatal amount of cholera germs could be injected intravenously without harm. Seven human subjects were then given a bile pill and a tablet of desiccated cholera germs on an empty stomach on 3 successive days, whereupon their blood showed a marked increase of anticholera agglutinins and bacteriolysins.

TREATMENT.—Chatterjee (Indian Med. Gaz., Nov., 1924) favors the combined use of kaolinand potassium permanganate in cholera treatment. F. J. Palmer (*Ibid.*, Aug., 1924) reports gratifying results with cresol in a cholera outbreak in 1923. The patient is at once

given 1 to 4 minims (0.06 to 0.25 c.c.) of cresol, according to age and size, dissolved in a like number of ounces (30 c.c.) of tepid water. This is repeated every 1/4 hour for a couple of hours, the interval being then increased to ½, 1, 2 hours, etc., while at the same time the dose is slightly reduced. As the symptoms subside, small amounts of tepid water are given in the intervals. For excessive vomiting morphine, 1/4 grain (0.015 Gm.), is given hypodermically, or tincture of opium, 20 to 30 minims (1.3 to 2 c.c.), may be given with a 1st small dose of cresol and the dose increased to 3 or 4 minims (0.2 to 0.25 c.c.) if the 1st dose is not quickly rejected. In dry cholera, magnesium sulphate, 1 ounce (30 Gm.), dissolved in water, 2 ounces (60 c.c.), and containing cresol, 5 minims (0.3) c.c.), may be given as an initial dose. As the patient improves, 2 to 3 minims (0.15 to 0.2 c.c.) of cresol in water are given twice daily to lessen the tendency to the carrier state. After the attack great care in diet for some days is required, proteins being added only very cautiously. In cases with marked cerebral symptoms tube feeding from the start is indicated. Among 61 cases of cholera thus treated the mortality was 19.6 per cent.

Prophylactic as well as curative value is ascribed by Tomb (*Ibid.*, June, 1923) to a mixture of spirits of ether, oil of cloves and oil of cajuput, of each 30 minims (2 c.c.); oil of juniper, 5 minims (0.3 c.c.), and aromatic sulphuric acid, 15 minims (1 c.c.). One dram (4 c.c.) of this in ½ ounce (15 c.c.) of water is taken every ½ hour until vomiting and purging cease. As a preventive

among contacts, the same dose is taken once or twice daily for 1 or 2 days.

CHOREA.—According to L. Babboneix (Paris méd., Oct. 6, 1923), there exists a variety of chorea which is closely related to encephalitis lethargica, is not attended with joint or heart complications, and often occurs in epidemic form. This variety he further divides into 2 types, in the 1st of which the encephalitic nature of the disorder is indicated by rhythmic movements, a Parkinsonian syndrome, and mental disturbance affecting chiefly the disposition. In this type the immediate prognosis is favorable. In the 2d type there are continuous violent and generalized, movements, and a fatal termination always ensues.

In experiments on rabbits with cerebrospinal fluid from cases of Sydenham's chorea, E. Herman (C. r. Soc. de biol., Oct. 31, 1924) detected a filtrable virus which produced clinical manifestations similar to those caused by the viruses of epidemic encephalitis and caused corresponding pathologic changes.

Rosenow (Amer. Jour. Dis. of Childr., Sept., 1923) has isolated chorea strains of streptococci having a pronounced tendency to involve heart valves, joints and muscles, as well as the brain, and concludes that chorea is due to such a streptococcus, having peculiar neurotropic, immunologic and other properties. Characteristic localization followed intravenous and intracerebral inoculation, as well as the infection of teeth, in dogs. The symptoms produced were strikingly like those of chorea.

TREATMENT.—As noted by H. E. A. Boldero (Lancet, Oct. 25, 1924), fright, worry and excessive study render the rheumatic child more liable to chorea, and their

avoidance constitutes a factor in chorea prophylaxis. In the treatment, the 1 essential is rest and quiet, for the movements cease during sleep. The child must be put to bed and kept there, except in the few cases in which such confinement accentuates nervousness, in which event the child may lie on a sofa. In really violent cases the mattress should be on the floor, and the case constantly watched. In severe cases the discipline of a sympathetic but firm nurse is of great value. The diet should be liberal and appetizing. Hydrotherapy is valuable to promote rest and sleep, e.g., shampooing the head twice a day for 10 minutes is often successful. Hot or cold packs are often more effective than soporifics. Sedatives, while not curative, may be called for to procure a certain amount of sleep rather than to abolish the movements, e.g., chloral hydrate, 7 grains (0.5 Gm.), trional, 5 grains (0.3 Gm.), or chloretone, 5 grains, 3 times a day (for a 7-year child). Bromides may be usefully combined with the chloral. Chloretone is best given as an emulsion with liquid paraffin or codliver oil; when it is used, a watch must be kept for an erythema and incontinence of urine. Rheumatic manifestations call for salicylates with alkalies. A sore throat or even enlarged tonsils should be painted twice a day with:

R Phenylis salicylatis . 3ss (2 Gm.); Glycerini ............ f5ij (8 c.c.); Alcoholis (90 per cent.).....q.s. ad. f5j (30 c.c.).—M.

When the active stage is subsiding, a short course of arsenic, well diluted and in tonic doses only, is valuable. When the movements have almost ceased, iron should

always be given. Codliver oil and malt for 2 or 3 months should be ordered for those who have lost weight. Massage and exercise are beneficial if not started too early. At 1st the exercises should be crude and easy, e.g., touching the nose with the finger-tip and pointing the toes while walking along a line. Later, building castles with bricks or cards, knitting, piano exercises, etc., are useful to hasten recovery of voluntary motor control. When there are myocardial manifestations, rest in bed must be complete and prolonged until there are no further signs of activity—even for 6 months.

Further experiences with magnesium sulphate injections have been recorded. Among them is that of De Capite (Pediatria, May 15, 1923), who witnessed marked benefit in 3 cases from intraspinal injections of 0.1 to 0.15 Gm. ( $1\frac{1}{2}$  to  $2\frac{1}{4}$  grains) of magnesium sulphate in a 25 per cent. solution. One case recovered after a single injection, while the others needed 5 to 7 injections on alternate In other cases 2 c.c. (32 minims) of the solution were injected intramuscularly on alternate days, with equally favorable results. The most marked benefit was observed in 2 cases in which a little fluid had previously been withdrawn by lumbar puncture, to diminish the high intracranial pressure. Cassoute had previously reported recovery from chorea following lumbar puncture.

Because of their findings in 15 cases of chorea in which the Kottmann reaction was tested, J. D. Lyttle and L. P. Sutton (Amer. Jour. Dis. of Childr., Aug., 1923) suggest administration of thyroid gland as a possible aid in treatment.

According to R. D. Moffett and C. H. Smith (Arch. of Ped., Sept., 1924), sulpharsphenamin intramuscularly is helpful in chorea. child is 1st placed in bed for 24 hours, and then given an injection, usually in the buttock, of 0.01 Gm. of the drug for each kilo. of body-weight, the whole dose being dissolved in 0.8 to 0.9 c.c. of distilled water. Two additional injections are given at 5day intervals. Of 9 cases treated, 5 showed definite improvement. No local inflammatory reaction was observed, though 1 child developed an eruption and 2 had fever subsiding in 24 hours.

J. Husler (Zeit. f. Kind., June 16, 1924), in severe cases, recommends nirvanol—a compound which chemically phenylethylhydantoin and related to luminal. The dose is 0.3 Gm. (5 grains) a day, continued usually for 8 to 10 days. The drug nearly always produces a general reaction with fever, a morbilliform or papular eruption, and sometimes conjunctivitis. The drug is stopped when these phenomena appear. Generally the eruption and fever are attended with a transitory exacerbation of the chorea, after which the latter is rapidly improved or disap-The benefit is pears completely. ascribed by the writer to a chemical effect on the corpus striatum.

Among the advocates of protein therapy in chorea is R. G. Ferrer (Arch. españ. ped., June, 1924), who administers subcutaneous injections of 5 to 10 c.c. (80 to 160 minims) of sterile milk at intervals of 3 or 4 days. The nervous symptoms are at first aggravated by the injection, but relief may thereafter follow even the 1st injection, and after 3 injections

not only the choreic movements but also the paresis, anorexia, aphasia, etc., are frequently cured. In cases that do not respond, the patient's own serum may be injected intraspinally or arsenic or mercury used.

J. Diner (Med. Jour. and Rec., Jan. 21, 1924) states that pathologic research has fairly well shown chorea to be of bacterial origin. In 8 years he has treated 59 cases by the intraspinal autoserum method described by him in detail in 1917. Of these cases, but 1 later returned to the hospital with choreiform movements. The treatment has appeared successful in practically all instances. The average duration of treatment was 32.4 days.

Tonsillar infection seemed to be the origin of chorea in all of 23 cases seen by Dulaney (Ky. Med. Jour., Oct., 1924). Tonsillectomy and removal of any other infected areas in the nose and throat gave complete, immediate relief, which has been maintained to date in all instances.

#### CINCHOPHEN.—TOXICOLOGY.

—A case of severe poisoning by this drug also known as atophan and official as Acidum phenylcinchoninicum-in which various features of profound allergic shock were present is reported by M. Barron (Jour. Amer. Med. Assoc., June 21, 1924). The patient was a man aged 44, who had taken some time previously a course of cinchophen tablets for the relief of pain. The severe reaction began 5 minutes after he had taken two 7½-grain (0.5-Gm.) tablets, and began with itching and prickling sensations of the skin, general numbness, and a fall to the floor from muscular weakness, without loss of consciousness. He had a watery bowel movement, and when seen in bed an hour later showed deep, labored breathing, with the face, arms and chest a bright pink, the skin moist, the extremities cold, and the nails and lips deeply cyanotic. The radials were barely perceptible and the systolic pressure gave very faint tones up to 75 mm. The urine showed albumin, red cells, leukocytes, and hyaline and granular casts. He was given aromatic spirits of ammonia, strong black coffee, and caffeine sodiobenzoate hypodermically; external heat was applied. He recovered, and the next day was feeling as well as usual. Skin tests with cinchophen 1 week later were negative.

Cinchophen, according to Barron, is a renal irritant in many cases when given in ordinary doses. Neocinchophen produces renal irritation and other by-effects, but in a less degree than either cinchophen or the salicylates.

CIRRHOSIS OF THE LIVER. -SYMPTOMS.—In a study of 44 cases of cirrhosis, comprising 30 males and 14 females, S. Laache (Norsk Mag. f. Laeg., Apr., 1923) found 26 cases of atrophic cirrhosis, 5 of hypertrophic cirrhosis, and 4 of syphilitic cirrhosis. Aside from the usual ascites, present in over \(^2\)\_3 of the cases, there were evidences of degenerative cardiovascular disease in about % of the cases. Hemorrhage from the gastrointestinal tract occurred in \(\frac{1}{3}\). Jaundice was present in all the cases of hypertrophic cirrhosis, in 2 of the syphilitic cases, but in only 3 of the 26 cases of atrophic cirrhosis. There was a history of alcoholism in 38.6 per cent., exclusively among the males. In ½ of the whole series the cause was obscure, suggesting that some underlying predisposition to cirrhosis occurs. The average duration of life after the appearance of ascites in 8 males was but 10 to 12 months, and in 4 females but 5 or 6 months. This symptom is therefore an unfavorable prognostic omen.

Although portal cirrhosis is supposed to occur oftenest in the 5th decade of life, the average age of A.

Bassler's (Med. Jour. and Rec., May 21, 1924) patients was but 38 years. He lays stress, as regards the causation of cirrhosis, on the saccharobutyric type of chronic intestinal toxemia, which he has, since 1915, been able easily to demonstrate in all cases in which portal cirrhosis was disclosed at operation, whether the individual was alcoholic or not. In this type of toxemia. alcohol and fermented malted fluids feed the infection and enhance it. Hepatic enlargement is frequently present, usually affecting the whole organ, so that the right lobe is found lower than normal. The left lobe not uncommonly is firmer than normal. In the younger persons gall-bladder disease often coexists. As for the symptoms previous to the appearance of hemorrhages and ascites, sometimes for a year or 2 there has been distress in the stomach region, more or less independent of meals, but usually intensified by excess. Probably because of active congestion of the organ, there is occasionally a sense of weight in the right hypochondrium, perhaps short attacks of slight fever, mild jaundice for a few days, and sometimes local pain and discomfort, with tenderness on deep pressure. More often the early symptoms cannot be dissociated from gastroenteric catarrh or the saccharobutyric toxemia, viz., coated tongue. flatulence, irregular appetite, nausea and sometimes vomiting in the early morning, alternating constipation and diarrhea, hemorrhoids and similar conditions. Weight may be lost, through diminished resorption power of the bowel. Tympanitic attacks may occur. In saccharobutyric toxemia, the presence of an enlarged

liver that cannot be accounted for by some other cause, such as passive congestion, fatty liver, malaria, syphilis or malignancy, warrants the diagnosis of cirrhosis.

ETIOLOGY.—An increase in the ratio of women to men having hepatic cirrhosis has been observed since the war by A. Chauffard and P. Brodin (Bull. de l'Acad. de méd., May 6, 1924). In 23 cases seen in 1922 and 1923, 16 were in women. Whereas in the men an atrophic cirrhosis of the Laennec type was always present, in the women the disease was of several varieties, usually featured by enlargement of the liver, fatty as well as fibrous changes, and clinically, by acute flare-ups. Three cases had a positive Wassermann reaction and were cured by antisyphilitic treatment. There were 6 cases of the icteroascitic syndrome of Fiessinger and Brodin, beginning with jaundice, followed sooner or later by ascites, and featured histologically by a marked annular cirrhosis together with massive fatty degeneration. Five of these cases died, while the 6th, which had a positive Wassermann, recovered under mercury cyanide. Alcoholism and syphilis being present with equal frequency in the men and women, there must be some other factor to account for the different lesions in the 2 sexes, possibly an inherited greater resistance to the effects of alcohol in the men.

DIAGNOSIS.—In a study of the peripheral venous pressure in normal subjects and cases of cirrhosis and other disorders, M. Villaret and F. Saint-Girons (Paris méd., May 17, 1924) found the venous pressure usually lowered in venous cirrhosis (in-

cluding both hypertrophic and atrophic cirrhosis) with or without ascites, both in relation to the normal venous pressure and the systolic arterial pressure. Normally there is a constant relationship of venous to arterial pressure, wherein the same figure (13 cm. in men and 12 cm. in women) applies to the venous pressure as measured by the water manometer and the arterial pressure as measured by the mercury manometer. Whereas in venous cirrhosis the venous pressure is lowered, in ascites without cirrhosis it is usually normal or increased; this difference is of some value in ascertaining the source of an ascites in the individual case. Venous pressure studies may also assist in finding out whether an enlargement of the liver is due to cirrhosis or merely to passive congestion.

TREATMENT.—Laache (loc. cit.) advocates in cirrhosis a salt-free lactovegetarian diet, together with the use of diuretics. Calomel is particularly effective. A. Lemierre and J. Lévesque (Presse méd., Nov. 29, 1922) have observed that when ascites is associated with an irreducible peripheral edema (anasarca), the latter may disappear under a combination of the salt-free diet and repeated paracentesis of the abdomen. general, however, the salt-free diet in cirrhosis, while well borne at first, and tending to delay the return of the ascites, eventually leads to depression and loss of appetite. At this juncture, the general condition shows prompt improvement if salt ingestion is resumed, but the peritoneal effusion increases rapidly.

A form of atrophic cirrhosis secondary to a lesion of the spleen, the latter disturbance, in turn, having been due to some infection harmful to the spleen, especially malaria or relapsing fever, is emphasized by P. Millous (Paris méd., Aug. 16, 1924). The condition is attended with ascites, collateral venous circulation of the abdomen, edema of the lower limbs and enlarged spleen. It is similar to Banti's disease. Banti did not associate malaria with the disease which bears his name, but the writer doubts the actual absence of malaria in Banti's cases, in view of the prevalence of malaria in the region in which his studies were conducted. The advantages of quinine in these cases are brought out by the writer on the basis of his experiences with 6 cases, 4 of which were cured by it. While Banti recommended only splenectomy, quinine often gives such benefit that the operation is not required. If splenectomy is decided on, vigorous quinine medication should precede it; otherwise, a fatal malarial paroxysm may follow the intervention.

In a case reported by J. Porto (Med. Contemp., June 8, 1924), cirrhosis was found due to an overlooked congenital syphilitic infection, and the patient recovered almost completely under antisyphilitic treatment, although the evidences of cirrhosis were of 5 years' standing.

W. J. Mayo (Ann. of Surg., Sept., 1924), discussing the surgical treatment of hepatic cirrhoses, divides the cases into portal cirrhosis, in which the toxic substances enter the liver by the portal circulation and ascites and gastric hemorrhages occur, and the less common biliary cirrhosis, in which the toxics enter through the bile channels and the chief clinical feature is chronic jaundice. In

portal cirrhosis the **Talma-Morison** operation has given some good results; of 47 cases operated on in the Mayo Clinic, 7 died in the hospital and 21 were alive when last heard from, including 4 still living 5 to 9 years after operation.

Portal cirrhoses may be subdivided into the splenic type, in which toxics reach the liver through the splenic portion of the portal vein and there is primary splenic enlargement and secondary contraction of the liver, and the gastrointestinal type, in which the toxics enter through the gastrointestinal portion of the portal vein (alcohol, pepper or other irritants) and there is primary contraction of the liver and secondary splenic enlargement. The results of surgical treatment differ in these 2 types. Of 97 patients splenectomized for splenic anemia, 42 had more or less portal cirrhosis; of these 42, 4 died in the hospital and 21 were alive when last heard from, including 9 still alive 5 to 9 years after operation. In the gastrointestinal type the results were not nearly so good; 3 deaths in the hospital occurred out of 10 cases subjected only to splenectomy, and there were 2 deaths among 9 other cases in which the Talma-Morison operation was carried out in addition.

In biliary cirrhosis the usual cause is stone in the common duct or obstruction in the head of the pancreas. The biliary tract should be cleared of obstructions and free bile drainage established. Splenectomy is unnecessary. The results are usually good. There is another type of biliary cirrhosis in which no infection or obstruction in the ducts is demonstrable. The ducts are greatly

thickened, and chronic jaundice present. The liver is firmer and the spleen much more enlarged than in the other type. In these cases splenectomy appears to have value.

When tests show the liver function reduced to below 25 per cent., any serious operation is likely to end fatally.

CLEFT PALATE. - Presenting his recent conclusions concerning the treatment of congenital cleft palate, T. W. Brophy (Minn. Med., May, 1924) advises operation early in infancy for the best results as to speech and facial contour. The procedure is carried out in 4 stages: (1) Freshening, approximation and immobilization of the cleft bones; (2) closure of the lip; (3) closure of the soft palate; (4) elevation of the nose if flattening resulted when the premaxilla was moved back. The 1st stage is best carried out between the 4th and 10th weeks of life; the 2d, 6 to 10 weeks later; the 3d is best deferred until just before speech is attempted, i.e., not earlier than the 18th month; the 4th may be done at any later time.

Protruding premaxillas should never be removed, but treated as a recent fracture, being moved into place after freshening of the edges to be apposed, and immobilized by wires passed anterior to the premaxillas and beneath the soft parts. By passing wires through the maxillary bones anteriorly and posteriorly and adjusting lead plates, the operator can approximate the alveolar processes and at least 13 of the palatal plates of the maxillas, moving and holding the tuberosities in normal position, so that when the soft palate

is united it will have normal length and flexibility.

### CLUB-FOOT. See TALIPES.

COCAINE.—PHYSIOLOGIC ACTION .- That the effects of an excess of cocaine may resemble the triad of symptoms typical of exophthalmic goiter is pointed out by H. W. Maier (Schweiz. med. Woch., Jan. 1, 1925). Exaggerated sympathetic functioning is present in conjunction with increased activity of the higher psychic functions. There is less desire for sleep. In men, libido is decreased; in women, it is increased. In stimulating the motor functions, cocaine leads to accelerated action without impairing the results of the action; thus, figures may be added correctly but more rapidly. In practice, however, this advantage is annulled by the fact that the individual"s attention is too much distracted.

ACUTE POISONING.—Among 46 cases of fatal cocaine poisoning summarized by E. Watson-Williams (Brit. Med. Jour., Dec. 1, 1923), the dose was stated to have been less than 5 grains (0.3 Gm.) in 9 cases, and the dose was unknown in 12. The poisoning was by oral ingestion in 13 instances.

A case of death in a man of 50 years following injection of 5 c.c. (80 minims) of 2 per cent. cocaine solution into the urethra has been reported by P. Flandrin and P. Gresset (Jour. d'urol., Aug., 1924). The drug had been introduced after an initial attempt at catheterization and cystoscopy had failed on account of pain. Clonic convulsions developed a few minutes after the injection, the breathing became stertorous, and death occurred in 10 minutes. Postmortem the heart was observed to be considerably dilated. The rapid absorption of the drug is thought to have taken place through a slight abrasion found in the mucous membrane of the urethra.

Treatment.—Little has been contributed of late on this subject. According to the experiments of S. Weiss (Jour. Amer. Med. Assoc., Oct. 13, 1923), earlier reports relative to the value of calcium chloride in cocaine poisoning were unwarranted, a combined injection of this salt with cocaine proving more toxic than an equal amount

of cocaine alone, presumably because of more rapid absorption of the hypertonic solution.

In animals A. L. Tatum, A. J. Atkinson and K. H. Collins (Ibid., Apr. 18, 1925) found evidence that in cocaine poisoning the respiratory center fails in a stage of overactivity or excitability, the rabbit, especially, showing an increasingly rapid and shallow respiration, passing into a respiratory flutter or tremor, and then ceasing all activity. On this basis, hypnotics were found useful in both the prevention and treatment of cocaine convulsions. In dogs, intravenous use of barbital-sodium, with or without paraldehyde, previous to the onset of convulsions yielded an increased tolerance to cocaine of about 400 per cent. During convulsions the benefit decreased in proportion to the delay in administra-

tion of the hypnotics.

**COCAINE ADDICTION.**—Whereas 15 or 20 years ago most drug addicts acquired the habit through physical disease or discomfort, today, as noted by C. E. Sceleth and S. Kuh (Jour. Amer. Med. Assoc., Mar. 1, 1924), the number of new addictions through physician's prescriptions is small, the great majority of cases resulting from association with addicts. Cocaine habit is a pleasure or vicious habit, without true withdrawal symptoms. Heroine is usually the same, but its use leads to a true habit like that of morphine. Cocaine and heroine will produce a psychosis more quickly than morphine. In the South, most of the negro drug users are cocaine habitués. In New York, out of 7464 cases, 96.5 per cent. were found to be heroine users. In Chicago, less than 4 per cent. are heroine users. The nature of the disorder that impels the drug user to use narcotics is mostly psychologic, and in the so-called withdrawal symptoms there is also a psychic element of no small importance. All the writers' addicts behave normally when the drug is unobtainable. Very few addicts come for treatment until they begin to get more grief than pleasure from the drug. Even in the better types of addicts, judgment is defective, relapses often occurring because the patients believe they can take a 1/8- or 1/16-grain dose without danger, or because, before they became addicted the 1st time, they may have used the drug off and on for some time without severe abstinence symptoms, and therefore do not fear it as they should. The "accidental" addict has by far the better prognosis.

COCCYGODYNIA. - Epidural injections of lipiodol were found useful by Sicard and Coste (Bull. Soc. méd. des hôp. de Paris, Mar. 6, 1924) in this condition. The amount injected was 5 to 10 c.c. (80 to 160 minims), the preparation being previously slightly warmed. Preliminary local anesthesia with procaine is employed, and the injection made with the patient in the knee-elbow posture. A test for proper entrance of the needle into the epidural space is to inject 2 or 3 c.c. of air, which should disappear, but with the needle improperly placed will give rise to crepitation palpable in the subcutaneous tissues. After the injection the patient is placed in the Trendelenburg position for 4 to 6 hours. Of 5 cases of coccygodynia 2 were cured and 2 improved. Good results were obtained also in lumbar sciatica (7 out of 10 cases cured) and in idiopathic nocturnal enuresis (relieved in 4 out of 7 cases). No untoward effects followed the injections, other than backache in some cases, lasting for 1 day.

CODLIVER OIL. -With the crude methods of production of this oil which have prevailed until recently, a strong taste and odor have come to be so definitely associated with it that manufacturers of adulterated oil have flavored it with rotten herring to give it the proper "atmosphere." As pointed out by J. Garland (Boston Med. and Surg. Jour., Aug. 21, 1924), oil prepared by modern methods, with prompt selection of fresh, healthy gray livers that float, immediate application of steam, clearing by chilling and removal of stearin, and bottling in colored glass, is almost

colorless and largely devoid of unpleasant, taste and odor. Most firms test the oil for its vitamin A content and some for its antirachitic effect on the white rat. Administration of an unselected jobber's oil followed by a selected reliable oil in the same patients in the Boston City Hospital seemed to show, by the blood and clinical findings, the superiority of the latter product.

According to the experiments of Sjollema (Jour. of Biol. Chem., Aug., 1923), there is reason to suppose that the fat-soluble A (or the specific vitamin of codliver oil) prevents the consequences of diets deficient in this dietary factor through the influence it exerts on the mineral metabolism. Emphasizing the regulatory influence of codliver oil on calcium and phosphorus metabolism, E. A. Park, R. A. Guy and G. F. Powers (Amer. Jour. Dis. of Childr., Aug., 1923) refer to the striking constancy with which, in their experiments on rats, the previously disturbed concentrations of calcium and phosphorus moved toward those found in the blood of healthy rats on ordinary diets. In addition, the oil makes the metabolic processes of the body in respect to calcium and phosphorus vastly more efficient. The similarity between the action of codliver oil and that of radiant energy is so close that a connection must exist between them.

THERAPEUTICS.—As regards digestibility, vitamin A content, and especially the antirachitic factor, Garland (loc. cit.) deems codliver oil a most valuable adjunct to the diet of infants. Its use in sufficient amounts—2 drams (8 c.c.) a day—should be universal in this climate and under present conditions of life. Its value as a preventive and cure for rickets is second only to that of direct sunlight and ultraviolet radiation. In prescribing it, the reliability of the brand should be considered, and when possible its antirachitic value should be known.

COLITIS.—ETIOLOGY.—As pointed out by Sir Humphry Rolleston (Lancet, May 12, 1923), a deficiency of the antiscorbutic vitamin C has been shown experimentally by Findlay to reduce resistance to in-

fection, and McCarrison's observations suggest that lack of watersoluble vitamin B favors the incidence of inflammation of the alimentary canal. In the treatment of ulcerative colitis, the diet may reasonably contain sufficient antiscorbutic food and a fair quantity of protein. H. Grundzach (Polska gaz. lek., May 11, 1924) similarly recognizes a chronic avitaminous colitis, featured by attacks of mucous diarrhea several times a day and at night, with resulting emaciation. Recovery soon takes place upon addition of butter, eggs, fresh vegetables and fruit to the diet.

DIAGNOSIS.—After the detection of a certain number of cases of colitis due to syphilitic, amebic or tuberculous infection by appropriate clinical examination and the history, there remains a considerable number of cases with colon and pyogenic germs present, but no other discoverable causal agent. Aside from the striking chronicity and recurrent character of chronic ulcerative colitis, H. B. Stone (Ann. of Surg., Mar., 1923) calls attention to an outstanding symptom, not usually referred to, viz., inability to eat because entrance of food into the stomach immediately starts reflex peristalsis in the colon, with sharp pain and an urgent desire to defecate.

The coprologic evidences of colitis are discussed in a practical manner by R. Goiffon (Presse méd., Apr. 26, 1924). The best procedure for demonstrating intestinal mucus is to spread out the feces. Mucus, however, is much more rarely present macroscopically in colitis than is generally thought. It is well to prepare a dilution of feces in a mortar,

pour it into a dish, and inspect for brown, mucoid masses of viscid consistency, which constitute a significant evidence of colitis. Albumins and albumoses in the feces point to a severe exudative lesion of the bowel, and are readily tested for by precipitating 10 c.c. of a 5 to 2 per cent. dilution of feces with 2 c.c. saturated mercury bichloride solution. If the response is positive, the coagulated albumins fall to the bottom of the tube, leaving clear fluid above. Diarrhea is 1 of the most reliable signs of colitis, provided undigested cellulose, starch, iodophilic bacilli and bilirubin are not present in the stools. Reduction of the organic acids normally present is another important sign, which may result either from alkaline hypersecretion or ammonial putrefaction in the right colon. An excessive number of spirilla points to putrefaction, probably in the proximal colon. Large numbers of Blastocystis hominis or Entamæba coli likewise point to colitis, as does also the presence of starch residues in stools of normal appearance.

TREATMENT.—The close semblance of mucous colitis to pellagra is pointed out by L. G. Neal (Jour. Med. Assoc. of Ga., May, 1924). The symptoms are both nervous-headache, insomnia and various delusions -and gastrointestinal, the latter more marked after taking food. Constipation is nearly always present, gas often disturbing, abdominal pain more or less constant, and mucus usually noticed by the patient, especially after a purge. The patient should be warned that 6 to 12 months, or even longer, will be required for a cure. The diet at first should consist of milk, cheese, eggs,

gelatin, butter, fresh figs, and small amounts of bread, preferably graham. Later, the bulky vegetables and meat are gradually added. Exercise and rest should be carefully regulated. Of drugs, the best are arsenic and belladonna, the former as sodium cacodylate given intravenously to tolerance, and the latter as the tincture, in 3 drop doses after meals until physiologic effects come on. Pain referred to hyperacidity is generally controlled by sodium bicarbonate, 30 grains (2 Gm.), and bismuth subnitrate, 1 dram (4 Gm.), after meals. If there is hypoacidity, hydrochloric acid should be prescribed. Gas may be reduced by charcoal, 10 to 20 grains (0.6 to 1.2 Gm.) every 3 hours. Magnesium citrate is serviceable for constipation not controlled by the diet if hyperacidity exists; otherwise castor oil should be used. Benefit attends occasional colonic irrigations.

According to H. Strauss (Deut. med. Woch., Dec. 28, 1923) lubricants such as liquid paraffin are to be preferred for bowel activation in colitis. In local treatment, he favors soapsuds enemas to soften the stools. For astringent purposes he prefers 10 per cent. lime water enemas to the irritating silver enemas. To soothe the intestinal wall, as well as to loosen the stools, he employs either oil enemas or an enema made up of finely powdered metallic aluminum, 2.5 Gm. (38 grains), and a 10 per cent. decoction of salep, 250 c.c. (8 ounces), with addition of a few drops of opium tincture if required. Intestinal irrigations, spa treatments and mud or peat baths are also of

In severe cases of *ulcerative colitis* of 1 year's standing, unimproved by

other treatment, A. Bassler (N. Y. Med. Jour., July 18, 1923) has found the use of certain dyes of great benefit. Bacteriologic study of the stools by the Gram method previous to selection of the dye to be used is advantageous. The Gram-positive and Gram-negative organisms are counted as one would leukocytes. One-third Gram-positive and % Gram-negative are taken as the normal standard, and departures either way from this serve for the dye selection. The colidysentery-typhoid organisms are all Gram-negative and are best controlled with neutral acriflavin, while the streptococci, staphylococci, B. anthracis, B. putrificus and B. Welchii are Gram-positive and are inhibited by gentian violet. Acriflavin may be used in the bowel in 1:1000 to 1:5000 strength and in amounts up to 1 liter. It may also be used by duodenal tube, preferably in normal saline solution, or by enema, and in 0.1 Gm. (11/2) grain) enteric-coated tablets taken frequently during the day it is of benefit at the conclusion of active treatment. Gentian violet is used in 1:1000 to 1:8000 solutions; by duodenal tube, best in hypertonic solutions, or by enemas or enteric 0.5 Gm. (7½ grain) pills. Mercurochrome-220 in 1 per cent. solution is potent in all infections, but is very irritating and indicated especially in the syphilitic cases.

The dyes were used with success in 37 cases of infective and ulcerative colitis; in but 1 of these was a fistulous opening in the right colon required. The best procedure is first to irrigate the intestine with a hypertonic solution containing sodium or magnesium sulphate and phenolphthalein, using up to 1 liter; then,

when the bowels are flushed, to run in the dye solution through the duodenal tube still in situ. If gentian violet is used, it may be simply added to the hypertonic solution. Home use of the dye by the patient in enemas, pills or tablets enhances the result. Dieting is unimportant when the dyes are used, but rest is a valuable adjunct. After the clearing up of the infection and ulceration the colon remains friable, indicating occasional doses of bismuth, building up of the body, and agar by the mouth.

B. B. Crohn and H. Rosenberg (Jour. Amer. Med. Assoc., Aug. 2, 1924) report 78.5 per cent. of improvement or cures in chronic ulcerative colitis by the use of acriflavin. An enema of 750 c.c. (11/2 pints) of an aqueous or saline 1:4000 solution of the dye is given twice daily and retained for 20 minutes. Abdominal stupes, electric pads, baking, etc., considerably relieved the abdominal pain of colitis and the attacks of gas colic. For sedation of hyperperistalsis, 3 minims (0.2 c.c.) of tincture of deodorized opium every 3 hours will diminish, without halting, the intestinal motility. In an obstinate case, 2 large weekly doses of polyvalent antidysenteric serum, given intravenously, led to improvement.

According to L. von Friedrich (Deut. med. Woch., Aug. 15, 1924), pancreatic preparations are of value in obstinate cases of ulcerative colitis. He ascribes the benefit to improved digestion in the intestine, with resulting reduction of the amount of undigested material entering the cecum. Other measures advocated are rest in bed, the thermophore over the abdomen, and ingestion of cal-

cium, tannin and bismuth preparations.

N. P. Norman (Amer. Jour. of Electr. and Radiol., Apr., 1923) stresses 5 main factors in the treatment of mucous colitis: (1) Removal or correction of focal infections; (2) a diet balanced in proximate food principles and vitamins, especially vitamin C; (3) free mechanical drainage of the colon by introduction of fluid into the rectum, whence it can be caused to travel to the cecum by reverse peristalsis; (4) acidophilization of the intestinal tract by ingestion and rectal implantation of viable strains; (5) autogenous vaccines. Ingestion of lactose, dextrin, fruit and vegetable residue will promote the growth of the aciduric type of bacteria. Benefit has followed the use of a combination of castor oil, menthol and iodine in keratin-coated capsules.

> Surgical treatment of chronic ulcerative colitis is advised by T. C. Evans (Brit. Med. Jour., Jan. 31, 1925) when the condition is of 2 or 3 months' standing, without intermission and with profound emaciation and anemia unresponsive to medical treatment. Mixed infection then invariably exists, and in severe cases the colon is comparable to an abscess or bag of pus. Sigmoidoscopy is indicated and may reveal pronounced ulceration of the lower bowel. The proper treatment is frequent irrigation of the large bowel through an appendicostomy or valvular cecostomy.

COLON.—ADHESIONS.—Unwarranted neglect of the subject of pericolic membranes is regarded by W. L. Duffield (Long Isl. Med. Jour., July, 1924) as a prevailing tendency, in contrast to the extensive discussions of it a few years ago. Adhesive bands and deforming mem-

branes of the cecum and colon account for the not uncommon cases of persistent symptoms following appendectomy for a presumed chronic appendicitis. One of the 2 general varieties of these membranes is thin, slightly vascular, extending loosely from the lateral peritoneum over to or even across the colon; the other consists of shorter, denser and more vascular bands, usually limited to the outer side of the ascending colon, and is more likely than the 1st variety to be of inflammatory character. Often it is more important to diagnose and treat the pericolic membranes than the appendix. A suspicious case is one of a young adult of neurasthenic type, undernourished, with a history of constipation, vague but constant and nagging gastrointestinal distress, distinct flatulence, and tenderness even on slight pressure in the right iliac fossa, or actual hyperesthesia. Practically never is there a history of an acute attack. The treatment consists of laparotomy and ligation and section of the membranes. The adhesions seldom reform.

HEMORRHAGE.—Colonic hemorrhage that cannot be accounted for by ordinary conditions and diagnostic methods is discussed by C. G. Vervloet (Nederl. Tijd. v. Gen., Feb. 9, 1924). In a woman of 36, profuse hemorrhage, the 1st and long the only symptom, was associated with anemia and splenic enlargement. On the assumption, by exclusion, of a severe colitis, local treatment through a cecostomy was carried out, but the bleeding soon reappeared, and was permanently corrected only by colectomy. Histologically the colon in this case showed an unusually rich venous supply. In a child and

in a man, intense intestinal fermentation seemed responsible for colon irritation which was accepted by exclusion as the origin of the hemorrhage. These patients were cured by regulation of the diet. In another case, with the hemorrhage seldom accompanied with mucus, ordinary diagnostic procedures, including proctoscopy and the X-ray, were all negative.

According to R. Blum (Zeit. f. klin. Med., Dec. 30, 1924), bleeding erosions of the rectum are sometimes due to a vasomotor neurosis. Such cases were benefited by atropine and a bland diet.

IRRIGATION.—Hydrostatic stimulation of peristalsis is advocated by N. P. Norman (Amer. Jour. of Electr. and Radiol., Apr., 1924) as a measure for reëstablishing normal colonic function. Effective colonic irrigation can be achieved without inserting the tube more than 4 to 6 inches, by the following procedure: Introduction of 1 quart of water or saline solution starts a peristaltic wave travelling from Cannon's ring in 2 opposite directions, vis., to the cecum and rectum. As the wave approaches the latter it increases the pressure of the fluid instilled within the rectum, thus creating a desire for defecation. The flow of fluid is then reversed, about 1/2 of it being allowed to escape through the tube. This causes an abrupt dissipation of the contraction wave and reverse peristalsis sets in, propelling the remaining fluid to the higher levels of the colon and eventually to the cecum. During this phase of reversed peristalsis the inflow is allowed to continue. The process is repeated until about 4 to 6 quarts are retained, after which the tube

is withdrawn and the fluid expelled. The irrigations are generally given on alternate days for a week, then twice weekly for 2 or 3 weeks, and finally once weekly for 3 or 4 months. The indication for them is atonic distention and thinning of the colonic walls, or mixed spasticity of a portion of the colon and atonicity elsewhere. In general spasticity, they cause distress and are contraindicated.

MOTILITY.—As a standard test for the estimation of colonic motility H. W. Soper (Amer. Jour. of Roentgenol., June, 1924) has the patient take a 5-grain (0.3 Gm.) carmine capsule before and after the evening meal. A trace of the pigment should appear in the feces the next morning; on the 2d morning the entire stool should be colored, and by the 3d, all trace of the color should have disappeared. In the atonic colon, usually in persons of asthenic habitus, the test often shows retention of carmine for 7 or 8 days. This can often be corrected by diet, hygiene, and applications of magnesium and sodium sulphates, 25 per cent. of each in solution. Where atony is coupled with spasm of the iliac colon and rectosigmoid, local applications of magnesium sulphate solution are made through the sigmoidoscopic tube. Redundancies of the iliac and pelvic colon usually cause much distention of the lower abdomen and complaint of gas; restoration of function should always be attempted. In contracted descending and iliac colon with atony of the pelvic colon and rectum, causing obstinate constipation, water irrigation is actually the only means of relief. Patients with the generally contracted colon, often with low-grade catarrh of the mucosa or diverticulosis, should abstain from raw food and all laxatives. Sphincter dilatation and dry powder insufflation may constitute useful local treatment.

In chronic spasm of the colon, with intermittent abdominal pain, not of great severity, P. Turner (Guy's Hosp. Rep., Jan., 1924) witnessed rapid relief from belladonna and hyoscyamus. Rest in bed also brings improvement. There remains, however, a tendency to recurrence, sometimes on account of worry or overwork.

TUMORS.—Pain is a confusing symptom in cancer of the colon, according to D. F. Jones (Boston Med. and Surg. Jour., Sept. 11, 1924), because these patients seem to become immune to it; yet they will usually acknowledge abdominal discomfort, nearly always below the umbilicus. Many cases are diagnosed as appendicitis because of pain in the lower right quadrant. In the scirrhous type blood, pus and mucus are absent from the stools. The electric proctoscope is of great value in differentiating ulcerative or infectious colitis, or dysentery, from cancer of the colon. X-ray diagnosis in colonic cancer is unreliable, even in the hands of experts.

In the treatment, most patients will stand a colostomy, resection being carried out later when improvement has occurred. When possible a short-circuiting operation should be preferred to colostomy. Much of the risk of failure can be eliminated by proper walling off of the operative field and by making a lateral anastomosis instead of an end-to-end anastomosis when there is sufficient bowel, by using the closed method of suture when possible, and by doing a cecostomy instead of a colostomy.

Analyzing, with E. P. Hayden, 66 cases of cancer of the colon, Jones found 33 resections, with a mortality of 18 per cent., and 12 colostomies, without mortality. Of the cases with resection, 21 were living at the time of writing, including 14, 3 or more years after operation.

CONDURANGO. -From 8 years' experience, C. W. Maxwell (Med. Jour. and Rec., Sept. 17, 1924) concludes that fluidextract of condurango, in 20-minim (1.3-c.c.) doses every 2 hours until the required effect is obtained, then less often, is superior to any other drugs used in uterine hemorrhage due to fibroids, menorrhagia at the menopause, metrorrhagia, uterine hemorrhage of unknown origin, and hemorrhages due to cancer of the uterus. He considers it a specific in uterine hemorrhage after miscarriage or abortion, menorrhagia, postoperative hemorrhage, and prolonged bleeding after labor. In uterine fibroids or inoperable cancer, it controls the bleeding more quickly and lastingly than any other drug. It causes no pain or discomfort and does not upset the stomach.

CONJUNCTIVITIS. — ANA-PHYLACTIC.—In the case of a man aged 65 reported by H. Lagrange (Presse méd., Feb. 3, 1923), the patient has suffered for 10 years from itching erythemas coupled with swelling of the eyelids, chemosis and conjunctivitis. These symptoms developed when he handled wood, and a skin test with powdered oak bark led to a marked leukopenia and, after some hours, the development of an extensive urticarial reaction locally. Carrying bundles of green oak branches brought on the usual symptoms in 10 to 30 minutes. writer has also demonstrated an anaphylactic origin in several cases of vernal conjunctivitis.

ANGULAR.—In addition to the instillation, in angular conjunctivitis,

of a 2 grain to the ounce solution of zinc sulphate 4 times daily, F. A. Williamson-Noble (Lancet, June 28, 1924) has the following ointment applied to the lids at bedtime:

R. Ichthyolis ....... gr. ij (0.13 Gm.); Zinci oxidi ...... gr. iij (0.2 Gm.); Adipis lanæ hydrosi... 3j (4 Gm.); Petrolati flavi..q.s. ad 3ij (8 Gm.).—M.

It is very important to correct any errors of refraction, and as relapses are frequent the treatment should continue for a fortnight after all symptoms have abated.

CHRONIC CATARRHAL.—The same writer (Ibid.) notes that in chronic catarrhal conjunctivitis a slightly everted lower lid, when the inferior punctum does not drain the lacus lacrymalis may perpetuate the symptoms; in this event it is usually advisable to slit up the duct and remove a small triangular piece of its posterior (conjunctival) wall to avoid the constant epiphora. lotion of zinc sulphate, 1 grain (0.06) Gm.), and boric acid, 10 grains (0.6 Gm.), in water, 1 ounce (30 c.c.), is frequently of service. The conjunctiva may, however, become accustomed to the use of any particular drug, and it is well to have some alternative to the zinc salt, such as alum, 2 grains (0.13 Gm.), or glycerite of tannic acid, 8 minims (0.5 c.c.), to the ounce.

GONORRHEAL.—Further experiences with milk injections in gonorrheal ophthalmia are reported by Λ. Pillat (Klin. Monats. f. Aug., Apr. 14, 1923), who reports cure of 85.7 per cent. of 21 cases by this measure, without other treatment except saline irrigations of the eye every 5 or 10 minutes. The injections are made intragluteally, and

the dose is 2 c.c. (32 minims) in infants and young children, 3 to 8 c.c. (48 to 128 minims) in older children, and 10 c.c. (160 minims) in adults. The number of injections is from 2 to 7, and the time required for recovery was from 3 to 18 days, averaging 7 days. On the 1st 2 days two injections are given. If by the 3d day all gonococci have not disappeared, another injection is given on each of the 4th and 5th days. Silver nitrate treatment is then begun, and when the gonococci have disappeared, protargol or the alum pencil are substituted. Each milk injection causes a febrile reaction continuing over 24 hours. In ophthalmia neonatorum the results from milk injections are usually poor.

According to A. Rosica (Policlin., June 4, 1923), the use of vaccine therapy in conjunction with the ordinary local treatment is of great benefit, favorably modifying and shortening the course of the disease and reducing the incidence of corneal complications.

In regard to ophthalmia neonatorum, L. Lehrfeld (Amer. Jour. of Ophth., May, 1923) concludes from statistics that the average incubation period of this condition is 3 to 7 days but may exceptionally be as long as 2 weeks. A single instillation of any prophylactic is not a positive protection against the disease. The prophylactic toilet should be changed from 1 drop of strong silver nitrate solution to several drops of a bland but effectual antiseptic, such as a fresh 25 per cent, solution of argyrol, repeated on 3 successive days after birth, followed in each instance by thorough flushing of the eyes. In 1920, only 20 out of a total of 35

reported cases had received prophylactic drops. Out of 49 cases reviewed, 2 resulted in complete blindness in both eyes and 2 in diminished vision on account of corneal macules.

GRANULAR.—In trachoma, J. W. Wright (Amer. Jour. of Ophth., Apr., 1923) applies direct sunlight, concentrated by a 10 or 12 D. convex lens, slowly over the lids and retrotarsal fold, as well as over any existing corneal ulcer, usually twice a Excess of heat at a given area is avoided by tests on the back of the hand. In the absence of direct sunlight, the rays from an electric bulb may be used, but are not deemed as effective as the former. The light applications are regarded as being both stimulating to the affected tissues and antiseptic against the trachoma virus. Particularly must the retrotarsal fold be exposed to the Usually 3 applications will clear up an ulcer, and 1/2 dozen, the granules.

E. Junès (Rev. tunis. des sci. méd., Jan., 1923) recommends subconjunctival infiltration with mercury cyan-The solution used contains 1:3000 of the mercury salt and 1 per cent. of cocaine hydrochloride in distilled water. The anesthetic solution, 2 drops of which are placed in each eye, 3 or 4 minutes apart, about 10 minutes before injections, consists of 5 per cent. cocaine hydrochloride solution with 5 drops of 1:1000 adrenalin added in each 10 c.c. (2½ drams) of solution. The mucous membrane is gently lifted with forceps at a distance of 6 or 7 mm. from the cornea and in the area between the superior and inferior recti, and the needle, pointing upward, inserted in the base of the fold thus raised, with its point passing through the conjunctiva, but not The forceps is then redeeply. moved and the solution injected, gradually raising the conjunctiva around the cornea. The upper culde-sac is filled. Pain and chemosis follow the disappearance of the anesthesia, and may be allayed by bed rest in a darkened room, hot or cold compresses to the eye, analgesics, etc. The patient should remain indoors for some days. Later, dark glasses may be worn and eye washes employed, e.g., copper sulphate, 1 Gm. (15 grains); guaiacol, 0.2 Gm. (3 grains), and glycerin, 10 Gm. (2 fluidrams). One to 4 injections, at intervals of 2 or 3 weeks, are required.

Müller and Högler (Wien. klin. Woch., Dec. 7, 1922) report gratifying results from radium in 5 cases.

In the diffuse form of trachoma, with inflammation of the whole conjunctiva and absence of granules, A. Elschnig (Wratsch, Oct. 15, 1922) recommends hourly instillations of 1:5000 mercury oxycyanide solution, dry cold, and if there is profuse secretion, 1 per cent. silver nitrate solution. Daily or on alternate days, the conjunctiva is cocainized and vigorously massaged, alternately above and below, with the index finger, which is wrapped with gauze dipped in mercury bichloride or oxycyanide solution. A few drops of silver nitrate solution are used after the massage if there is abundant secretion. By this treatment acute trachoma, nearly always diffuse, can be cured in 6 to 9 weeks.

VERNAL.—In mild cases, with slight or no bulbar involvement and

with cessation of symptoms in cold weather, W. C. Posey (Atlantic Med. Jour., Jan., 1924) has observed that this disease frequently disappears after 8 to 10 years, but only very rarely in 4 to 6 years, as an earlier classic writer on this subject had specified. In the severer types, with symptoms persisting through the winter and large, hard granulations studding the conjunctiva, the disease may continue 20 years or longer. Two cases of the writer's, in a father and son, illustrated the influence of heredity and the striking refractive changes which may be caused by vernal conjunctivitis of long standing. The prognosis of this disease has been greatly improved by the use of radium. As described by H. K. Pancoast, the procedure is to evert the lids and treat the entire involved conjunctival surface while protecting the eyeball against unnecessary exposure. A radium tube in an aluminum holder with comparatively little filtration is used. The holder is attached to a handle so that attendant's hand does not have to be exposed. As the reaction to the radium is rather intense, the best time for treatment is during the quiescent period of winter.

CONSTIPATION.—SYMP-TOMS.—According to W. C. Alvarez (Physiol. Rev., July, 1924), the symptoms oftenest associated with constipation can, in most instances, scarcely be due to absorption of poisons from the bowel, for the relief from these symptoms following a bowel movement is ordinarily very prompt. If the relief were due to expulsion of the toxic material, it would not follow immediately, but

occur later, after sufficient excretion had taken place to lower the concentration of the toxic material in the blood. Often the symptoms are merely due to mechanical irritation and distention of the rectum by the retained fecal masses. The rectum is exceedingly sensitive to pressure, and the classic symptoms of "autointoxication" can be produced in certain persons by packing the rectum with inert substances such as cotton or fat. The usual subjects of "autointoxication" are persons of particularly sensitive temperament.

DIAGNOSIS .- In differentiating spastic constitution from the ordinary atonic type, K. Hannemann (Münch. med. Woch., Apr. 4, 1924) finds a useful diagnostic aid in the fact that such patients almost invariably possess increased tonus of the leg muscles, especially the adductors. In making the test, he raises 1 of the recumbent patient's legs with both hands, flexes the leg, and attempts to abduct it, instructing the patient to relax his muscles. Normally there is no resistance, but in spastic constipation the adductors are contracted so that abduction is nearly impossible. In some instances the foot of the other leg, which is lying horizontally, turns inward at the same time. This sign points to extreme motor excitability, which includes the intestines. It varies in intensity with the severity of the bowel spasm and subsides when the spastic constipation is relieved.

TREATMENT.—Both the spastic and atonic types of constipation being the results of long-continued irritations and inflammations, curing the latter, according to R. M. Clarke (Cal. State Jour. of Med., Jan., 1923),

will also cure the constipation. The cathartic habit easily takes 1st rank as a producer of colonic irritation. Irregular defecation not only results in loss of the "call" to evacuation but also eventually to inflammation of the pelvic loop. Unusual stress, or any strain that is beyond the ability of the patient to carry indefinitely, either physical or mental, is a great cause of constipation. The removal of bulk from the diet is the 1 great means of reducing colon irritation. The diet is to be reduced to liquids yielding no residue and kept thus until bowel movement has been accomplished. Thereafter the diet is increased, gradually and carefully. All cathartics and enemas stopped. An intestinal powder which is soothing locally and provides bulk while the case is on the non-residue diet is given every 3 hours in the beginning. It consists of bismuth subnitrate, calcium carbonate and calcium phosphate in equal parts, taken in teaspoonful doses in water. An oil enema of cottonseed oil is given every evening at 8 or 9 o'clock. Hot fomentations over the abdomen for 15 to 20 minutes every 3 hours are very important, as is also rest, especially in exhausted patients. Exercise is of benefit only in dyschezia.

In the acathartic and dietary treatment of constipation, as described by F. L. Burnett (Jour. Amer. Med. Assoc., Sept. 27, 1924), the teeth must, as a preliminary, be made serviceable or useful false sets obtained. Hemorrhoids or fistulas should be properly treated. The patient is told that the trouble is not due to the bowel, but to improper mixture of the food. To improve this, the food must be thoroughly comminuted and mixed with the saliva, be of sufficient amount to

provide residue, be eaten only at meal times, and be simple and wholesome, without excess of sweet, fat or highly spiced food. The patient must try to defecate 1 hour or so after 2 of the meals. Later, more fruit may be added to the diet and cathartics gradually eliminated. It is well to have the patient keep a record for 1 week of the time spent at meals, the food taken, the time and kind of dejection, and an estimate of the intestinal rate. The latter is determined by ingestion of 50 c.c. of French millet seed with an evening meal and then noting the hours elapsing until 5 or more seeds are 1st and last easily seen in the feces. The record is examined at the end of the week and suggestions made. During the 3d week another record is taken and examined, and later a record is kept once a month for some time. By this treatment in 100 cases the writer procured relief from the cathartic habit and from persistent headaches, lessened fatigue, and sometimes a gain in weight with improved general health.

In a case reported by B. Myers (Lancet, Oct. 18, 1924) in a girl aged 14, constipation had been present since birth and the skin and general appearance suggested a toxic condition. A movement was obtained only once in 7 or 8 days. Various measures having been tried without result, pituitary whole gland (Armour) was prescribed, 1 grain (0.06 Gm.) 3 times daily after meals, together with small doses of liquid paraffin. Following this the bowels moved daily and the general condition was greatly improved. Whenever the pituitary was stopped the constipation returned. Administration of this agent in bowel atony due to pituitary inactivity is advocated.

A useful manipulation for the relief of constipation attended with the presence of a fecal mass in the lower rectum, close to the anal sphincter, but hard to move because of its size or density, is described by H. B. Whitney (Jour. Amer. Med. Assoc.

Jan. 5, 1924). It consists of remolding the mass by external digital pressure. Sitting in the usual posture for defecation, the patient, with the 2d and 3d fingers of the left hand, carried down from behind, presses with the necessary degree of force on the thin, distended tissues between the coccyx and anus, and through these on the fecal mass directly beneath, with the purpose of changing When this is accomits shape. plished, the usual abdominal pressure is quickly effective. The digital pressure must always be considerable, and sometimes excessive; but even the latter is both painless and harmless, and the efficacy of the measure is often very remarkable.

Electrotherapy is recommended by L. Delherm and A. Laquerrière (Arch. des mal. de l'app. dig., June, 1924) for purposes of functional reëducation of the bowel in chronic constipation. In the painless leftsided constipation, the galvanic and faradic currents are employed regularly, with addition of a mild electric enema for stimulation if atony is a prominent feature. In spastic conditions galvanism and faradism are likewise used, with intra-rectal highfrequency according to requirements. In right-sided constipation, particularly with pain or colitis, the galvanic current is of value, 10-minute treatments with a current of 90 ma. or more, or 20-minute treatments with a 50 ma. current, being given. The treatment is supplemented with light baths or diathermy. Various combinations with radiotherapy and diathermy are indicated in constipation associated with asthenia, painful adhesions, bladder spasm, fissure or hemorrhoids, as well as in constipation related to gynecologic or prostatic disorders.

Spastic constipation, as described by C. D. Aaron (Amer. Jour. Med. Sci., June, 1923), is featured by alternating spasm and atony of different portions of the colon at different times. In spasms with prolonged haustral segmentation the fecal matter is in the shape of irregular balls, while in proctospasm it is cylindric or ribbon-like. By regular palpation of the abdomen and by the X-ray, strongly contracted sections of the colon may be located, especially of the sigmoid and descending colon. It is easy to distinguish between contracted and filled coils of the intestine by examining repeatedly and at various times of the day. The characteristic physical sign of spastic constipation lies in that the rectum, instead of being filled with feces, as is common in atonic constipation, fits closely around the examining finger, almost like a glove. The deciding diagnostic factor is, however, the X-ray examination.

In the treatment, physical and mental relaxation is the 1st care. Complete rest in bed or a fresh air treatment often suffices to induce normal defecation. The principal measure, however, is the diet, which should consist of soothing, antispasmodic foods. Laxatives and glycerin enemas or suppositories must be avoided. The diet aims to render the feces pasty and soft and the mucous membrane pliant and The writer prescribes as slippery. follows:

Breakfast.—Orange or grapefruit; porridge boiled in milk and strained, with sugar and plenty of cream and butter; weak or caffeine-free coffee, or buttermilk; 2 ounces of cream; toast, butter, honey, jam, or fruit sauce.

Luncheon.—A cup of mucoid soup; sardines in oil, tender vegetables with cream sauce; light egg dishes with vegetable purée and mashed potatoes; jam, stewed fruit (strained), or honey; cream cheese; caffeine-free coffee with cream; toast and butter; lemonade sweetened with 2 table-spoonfuls of levulose.

Dinner.—A dish of mucoid soup prepared with butter; 3 ounces of fowl, veal, pigeon, sweetbread, brain, tongue, tender fillet of pork or tender roast beef, or fish boiled with a free amount of butter sauce; potato purée boiled in milk and mixed with butter; macaroni prepared with butter; plenty of purée of spinach, yellow turnips, young green peas, cauliflower, or artichokes, with butter, cream, or the yolk of an egg; purée of stewed fruit, cream candies, or light farinaceous dishes with fruit or cream sauce.

(The mucoid soups are made from oatmeal, rice, wheat starch, potato starch, and corn starch. The grains are boiled 4 to 6 hours with water, passed through a fine sieve and again brought to the boiling point, butter or cream added, and the whole suitably seasoned).

Certain fruits are laxative in these cases, partly because of their fruit acids and partly because of their sugar content, which is likely to increase the fermentative processes, viz., oranges, baked apples, grapes and watermelon. Jams, jellies, fruit juices, citric acid, and lactic acid products are also of value. Butter, oil and cream act both mechanically and chemically.

Liquid petrolatum is indicated for lubrication. The sovereign medicinal agent is atropine or belladonna, e.g., extract of belladonna in ½ grain (0.008 Gm.) doses 3 times daily. For atropine may be substituted the less toxic eumydrin (atropine methylnitrate) in ½ grain (0.001 Gm.) doses 2 or 3 times daily. The use of

benzyl benzoate, 15 to 30 minims (1 or 2 c.c.) 3 or more times daily, is justifiable. If the above measures do not suffice, Fleiner's oil enemas, to be continued several months; at 1st daily, later every other day, and subsequently twice a week, are valuable. The injection consists of 250 to 500 c.c. (1/2 to 1 pint) of the purest olive oil, preferably to remain overnight if possible. If no spontaneous bowel action follows in the morning, a sodium-chloride small lukewarm water enema should be given. Warm applications to the abdomen frequently overcome the spasms. A Priessnitz abdominal bandage may be applied overnight, and a hot water bottle or electric pad placed upon the abdomen several times during the day.

According to H. M. W. Gray (Can. Med. Assoc. Jour., Feb., 1924), the causes of constipation are to be found, in the majority of cases, in the region of the ascending colon and in the sigmoid mesocolon. Of operative procedures in such cases, he has had the best results from cecocoloplicopexy.

CORNEA.—CANCER.—Two cases of carcinoma of the cornea dispelled by X-ray treatment are reported by A. Rados and H. R. Schinz (Arch. f. Ophth., Dec. 23, 1922). The dosage in the 1st case was 11/2 skin erythema doses. After 2 exposures, 4 weeks apart, the growth disappeared completely, and had not recurred 5 months later. In the 2d case 2 skin erythema doses were used, with the same effect on the tumor but the appearance 4 weeks later of a slight, temporary, punctate keratitis. The preferable procedure, consequently, is to employ 11/2 skin erythema doses at a single sitting.

HERPES.—Corneal herpes of ovarian origin is discussed by A. Niedermeyer (Deut. med. Woch., May 9, 1924). In his case the herpes recurred with the menstrual periods. Recovery took place under injections of ovarian preparations, although impairment of vision already existed when these were started.

**SOFTENING.**—While lack vitamin A has been generally held responsible for keratomalacia in children, G. Genck (Monats. f. Kind., Dec., 1922) asserts that there are other factors, in particular an individual predisposition and an inability of the system, on account of debility from infection, to make proper use of vitamin ingested. When conjunctivitis develops in a child on a diet poor in vitamin A, addition of codliver oil or butter fat to the diet is among the measures to be considered. In xerophthalmia (xerosis and keratomalacia) manifestations of scorbutus have often been noted, and at times deficiency of vitamin C appears to favor the production of the disturbance.

STAPHYLOMA.—In staphyloma of the upper 1/2 of the cornea, T. Inouye (Arch. f. Ophth., Dec. 23, 1922) employs a rubber pressure bandage, so supported at the orbital margin and the root of the nose that only gentle contact over the eyeball is made. A concavity is provided in the rubber, with a curvature less than that of the cornea. In order that the pressure shall be made exactly in the right spot, marks to define the position of the rubber are made on the orbital margin and lid. This procedure was employed with success in 7 cases of corneal staphyloma.

ULCER.—In ulcerative keratitis of pneumococcic origin, combined with hypopyon and dacryocystitis, G. Pacalin (Presse méd., Nov. 22, 1922) first incises and disinfects the lacrymal sac, to do away with contact of its septic contents with the conjunctiva. A gauze wick is kept packed in the sac until the corneal ulcer has healed. To the ulcer he applies an ointment of ethylhydrocupreine, 0.5 Gm. (7½ grains); methylene blue, 0.25 Gm. (334 grains); hydrated wool fat, 5 Gm. (75 grains), and petrolatum, 20 Gm. (5 drams). Ethylmorphine hydrochloride (dionin) is also used, either in a collyrium or powder, and markedly favors healing of the ulcer. In unusually severe cases, subconjunctival injections of it may be given. Atropine is necessary in all instances. For cauterization of the ulcer, if indicated, freshly prepared 5 per cent. tincture of iodine is best unless there is threatened panophthalmia, in which event the thermocautery is of value. For a powerful effect in severe cases, the writer gives subconjunctival injections of 1 c.c. (16 minims) of the following solution: Mercury cyanide, 0.005 Gm. (1/12 grain); ethylmorphine hydrochloride and acoin, of each 0.1 Gm. (11/2 grains), and sterilized distilled water, 10 c.c. (2½ fluidrams). If general irrigations of the eye are used, a solution isotonic with the lacrymal solution should be employed, e.g., mercury oxycyanide, 0.2 Gm. (3 grains); sodium chloride, 14 Gm. (216 grains), and distilled water, 1000 c.c. (1 quart). Milk injections, subcutaneous or intramuscular, have proven highly effectual. The initial dose is 5 c.c. (80 minims); it is repeated and gradually increased to 10 c.c. (160 minims) until a definite reaction appears. Another valuable measure is the use of hot compresses.

In a case of corneal ulcer reported by C. B. Williams (Jour. Amer. Med. Assoc., Mar. 31, 1923), influenza had been present 4 months before. The ulcer was of 1 month's standing, and had been induced by a small foreign body, later removed. Examination of the tonsils showed an encapsulated abscess in the submerged upper pole of the left tonsil—on the same side as the corneal ulcer. The ulcer improved on the 3d day after tonsillectomy and was healed in 10 days after the operation.

## CORONARY THROMBOSIS.

-The characteristic clinical features of this condition are enumerated by D. Riesman (Med. Clin. of No. Amer., Jan., 1923) as follows: Prolonged, severe retrosternal pain with or without radiation (pain more protracted than that of ordinary angina pectoris); symptoms of collapse with great fall in blood-pressure; a blanched, leaden hue of the skin, with slight cyanosis of the lips and coldness of the extremities; an overwhelming fear of death or the settled conviction of dissolution; fever; at times a slight leukocytosis; at times an enlarged and tender liver; pericardial friction (not constant); perhaps absent dorsalis pedis pulse; a history of previous attacks which may have resembled ptomain poisoning; at times a characteristic electrocardiogram. The diagnosis of this condition can usually be made. though one's 1st thought may be either of angina pectoris or some acute abdominal condition such as perforation of an ulcer, gall-stone colic, acute pancreatitis or ptomain

poisoning. Rupture of an aneurism, especially a dissecting aneurism, may produce a very similar picture.

TREATMENT.—In this connection Riesman disapproves of digitalis, but uses camphor in oil, caffeine sodio-benzoate and, if pulmonary edema is marked, atropine. In 1 of his cases, much benefit followed the application of 2 dozen leeches over the heart. Care should be taken, in the diet, to exclude articles promoting gaseous distention. Such distention occurs during the attacks and may play a rôle in their onset. Milk and buttermilk have proved the best foods during the seizure.

#### CORYZA. See ACUTE RIHINITIS.

CREATINURIA.—According to G. Frontali (Riv. di clin. ped., Sept., 1924), creatinuria even in children may be of pathologic significance. He distinguishes 2 separate forms of it, according as it can or cannot be arrested by the administration of cane sugar in amounts of from 40 to 150 Gm. Thus, in chorea the giving of sugar stops the creatinuria and manifests a conserving influence on metabolism that is not exerted by isodynamic amounts of other foods. On the other hand, in acute poliomyelitis and in pseudohypertrophic muscular atrophy-both disorders attended with trophic changes in the muscles,-the creatinuria is unaffected by ingestion of sugar.

CROUP.—In this section only the non-diphtheritic forms of croupy disturbance will be alluded to, the true diphtheritic croup being considered under the heading, DIPHTHERIA.

G. Swetlow (Med. Jour. and Rec., July 2, 1924) formulates the following differential features favoring a diagnosis of false croup: A short history of inflammation elsewhere, characterized by a nasal discharge or slight cough; attacks usually during

the night; sudden onset and abrupt termination; usually no fever; symptoms not so progressive nor so persistent as in diphtheria; color good between spasms; metallic cough; occurrence of several similar attacks during a single night, the spasms rarely progressing to the point of requiring intubation; no membrane on the tonsils or throat or in the nose; no submaxillary or cervical glandular enlargement. In a child of 7 years with croupy cough, marked retraction, temperature 103° and pulse 140, the condition was discovered, after antitoxin had been given, to be due to a perilaryngeal abscess arising from the presence of a safety pin, which was removed through the bronchoscope.

In the case of a child aged 14 months reported by J. P. Garrahan (Arch. lat.-amer. de ped., Dec., 1923), treatment for presumed diphtheria had been given but the condition was eventually attributed to infiltration of the epiglottis and neighboring lesions resembling syphilides. Antisyphilitic treatment was followed by recovery, although for about 2 months there had occurred repeated febrile attacks with congestion of the lungs.

TREATMENT.—In influenzal croup, which has been ascribed to an extreme hyperemia of the arterioles and capillaries and edema, with almost complete subsidence or absence of exudative processes, W. Arnold (Monats. f. Kind., Sept., 1924) obtains good results by the introduction of a small wad of cotton, secured to the forefinger with a thread and moistened with 0.5 to 1 c.c. (8 to 16 minims) of 1:1000 adrenalin solution. During the introduction the base of the tongue is depressed with the finger of the left

hand, as in intubation, and the cotton wad inserted past the epiglottis to the vocal cords. With slight additional pressure the deeper portions of the larynx can be reached, as indicated by cough. Any large accumulation of mucus in the pharynx should 1st be removed with a sterile sponge before the adrenalin wad is Results similar to those inserted. obtained with this procedure can be produced by fixing a spray apparatus to a spatula, passing the latter over the base of the tongue and spraying some adrenalin solution over the inlet of the larynx. The adrenalin acts by abruptly counteracting the local stasis through powerful constriction of the blood-vessels. The writer also deems the procedure of diagnostic utility, the stenosis due to diphtheria failing to yield to adrenalin because it is eminently an exudative process, whereas in influenzal laryngitis it yields to the local vasoconstrictor application.

CYSTITIS.—From experiments intended to elucidate the question of catheter cystitis, Hugh Cabot and J. L. Loomis (Jour. Mich. State Med. Soc., Jan., 1925) have concluded that retention of urine, and not the introduction of bacteria with the catheter, is the essential etiologic factor in this form of cystitis. Both experimentally and clinically, introduction bacteria and even moderate traumatization of the posterior urethra and bladder are incapable of producing cystitis. In fact, the bladder mucosa is able to resist infection by bacteria constantly reaching it from the kidneys over a long period of time. Discussing the prophylaxis of catheter cystitis, these observers

mention the following as illustrations concerning the indications for catheterization: (1) Cases in which retention is due to organic lesions of the bladder neck or urethra, or in which the floor of the bladder has sagged below the level of the outlet. In these cases infection can be avoided or, when established, can be cured only by surgical treatment of the lesions of the bladder neck, urethra or pelvic floor. (2) Cases in which the mechanism of urination is disturbed by faulty innervation owing to organic lesions, cerebrospinal syphilis, myelitis, congenital maldevelopment resulting in spina bifida, and spinal lesions due to trauma, tumor or tubercle. In these cases catheterization becomes inevitable, and likewise infection. (3) Cases of "reflex retention" commonly seen after operations and occasionally after severe injury. The bladder should not be allowed to fill up to a point beyond 10 ounces. Catheterization previous to overdistention is likely to eliminate the need of continued use of the catheter.

Two cases of hemorrhagic cystitis due exclusively to B. bifidus communis are reported by G. Cirillo (Jour. d'urol., Jan., 1924). The patients were girls aged 4 months and 3 years. The bacillus referred to is not pathogenic for laboratory animals, and destroys pathogenic germs in the infantile intestine. Both cases recovered in a few days under potassium iodide by the mouth.

Dissecting gangrenous cystitis is discussed by Costantini, Bernasconi and Duboucher (Rev. de chir., xliii, 590, 1924), who collected 91 cases, including 59 in women. The mortality is about 30 per cent. in women and 50 per cent. in men. The symptoms

consist of retention of urine, hematuria, malodorous urine, intermittent occlusion of the catheter, and, as a pathognomonic feature, the passage of fragments of the bladder mucosa. The commonest cause of the condition, which occurs between the ages of 25 and 40, is retroversion of the pregnant uterus, usually in the 3d to the 5th month; this cause was present in 28 of the 91 cases. Other causes are dystocia, caustic applications in the bladder, tumors, calculi, fracture of the pelvis, typhoid fever and diabetes. Pressure on the tissues is an important factor, and infection nearly always coexists, with careless catheterization frequently as its source. The partial or complete separation of the bladder mucosa results from submucous hemorrhage, infection and inflammation. Retention of the gangrenous tissues unfavorably influences the prognosis, and is more likely to occur in males, for anatomic reasons. Recovery or prolonged survival may occur even after most of the bladder has been eliminated. Residual functional deficiencies depend upon the amount of tissue destruction. Renal involvement may occur later through ascending infection. In the fatal cases death is commonly due to sepsis or peritonitis.

TREATMENT.—A method for the rapid cure of cystitis in children is described by J. C. Hirst (N. Y. Med. Jour., Mar. 7, 1923). With the child in the dorsal lithotomy position, the knees being held apart by an assistant or nurse, a small soft rubber catheter, previously boiled, is inserted into the bladder, after suitable cleansing of the vulva. The urine in the bladder having been allowed to

flow out, and without previous irrigation, 5 c.c. (80 minims) of 10 per cent. silvol or neosilvol solution are injected, the catheter being then quickly withdrawn. Usually the solution is retained from 15 minutes to several hours; even if it is passed at once, sufficient will remain. Occasionally anesthesia (light ether or chloroform for a few seconds) is necessary because of the child's unruliness-not because of any pain occasioned. In most cases after this procedure, tenesmus promptly ceases, frequency is reduced, and the child at once becomes comfortable and quiet. If symptoms recur or the urine does not clear promptly, the injection may be repeated. In girls of 6 or 7 years with cystitis of long standing and occasional exacerbations, repeated injections are often required, but in the acute cases, especially if treated without delay, results are prompt and good. The treatment proved entirely feasible even in an infant only 1 month old.

In cystitis and pyelocystitis with partial paralysis of the bladder following injuries or temporary affection of the spinal cord, as well as in postoperative cystitis after prostatectomy, A. Baer (Zent. f. Chir., June 23, 1923), upon failure of customary measures, including bladder irrigations, obtained good results with autogenous vaccine therapy. In the majority of instances there was a mixed infection of B. coli with staphylococci or diplococci. The cultures obtained were rinsed in saline solution, killed at 65° C., 1 per cent. of phenol added, and 4 suspensions of varying content prepared, ranging from 5 to 25 million killed germs per cubic centimeter. The injections were given according to the degree of cystitis, usually every 2 or 3 days. The course of treatment covered about 5 weeks. Definite improvement and diminution of bacteriuria began soon after the 1st injection, and progressed to a cure. In a few refractory cases, however, complete success required a 2d course of treatment after an interval of 6 weeks.

In the treatment of dissecting gangrenous cystitis, Costantini, Bernasconi and Duboucher (loc. cit.) advocate, in female patients, antiseptic bladder irrigations, particularly with Dakin's solution, when all of the bladder mucosa has passed out, as may be judged by floating it in water. Gradual removal of retained gangrenous mucosa by frequent irrigation is indicated if the patient's general condi tion is favorable; if not, dilatation of the urethra may be performed, the bladder incised through the vagina, or preferably, suprapubic cystostomy performed. If retroversion of a pregnant uterus exists, the organ should be reduced, if possible. In males, on account of the long, narrow urethra, the bladder mucosa is seldom evacuated, and the diagnosis has to rest more especially on retention and malodor of the urine, indications of peritonitis and poor general condi-The treatment is suprapubic cystostomy. Sequelæ such as incontinence, frequent urination and kidney complications may also call for suitable treatment.

Severe chronic cystitis with deep extension of the inflammatory process in the bladder wall, eventual replacement of the muscular elements by fibrous tissue, and resulting diminished capacity of the bladder and constantly increasing desire to urinate, is discussed by I. Szabo (Beitr. z. klin, Chir., cxxxi, 579, 1924). At times the primary condition is an ulceromembranous cystitis or a leukoplakia of the bladder. Ordinary oral and local measures proving ineffective, the treatment is surgical, and consists in curettage of the bladder, preferably de visu through a suprapubic opening, though in women the procedure can sometimes be carried out (less satisfactorily) through the short, dilatable urethra. Subsequent treatment consists of applying remedies directly to the denuded deeper layers of the bladder wall, preferably silver nitrate, beginning with a 1 per cent. solution, then rapidly increasing to 3 or 4 per cent. solutions, of which 10 c.c. (160 minims) are employed twice daily. Irrigations of the bladder with weak antiseptic solutions are also carried out, and hexamethylenamin, 3 or 4 Gm. (45 or 60 grains), is given daily by the mouth. This treatment is continued for 7 to 10 weeks, the suprapubic opening, if any exists, being kept open throughout this period for the purpose.

> Six cases of suppurative pericystitis have been reported by A. L. Chute (Jour. of Urol., May, 1923). The condition occasionally occurs after trauma to the deep urethra, and is featured by a tender mass above the pubes that does not disappear on evacuation of the bladder, together with the usual evidences of infection. The treatment calls for opening of the perivesical space and drainage of the cavity by tubes brought out through the perineum as well as by tubes introduced above. Usually it is advisable to combine a suprapubic cystostomy with this drainage. In cases with a tight stricture, badly injured urethra, or perineal suppuration, perineal section is indicated. For the often profound sepsis, energetic and

prolonged saline hypodermoclysis is of great therapeutic assistance. The same observer (*Ibid.*, Apr., 1924) stresses the value of dependent drainage of the perivesical region not only in conditions of the type of suppurative pericystitis, but also in conjunction with various operations involving probable infection of the perivesical tissues deep in the pelvis near the base of the bladder.

CYSTOPYELITIS.—Three cases of acute cystopyelitis which had been mistaken for appendicitis or gallbladder disease and, in 2 instances, already operated as such, are reported by H. Pollitzer (Med. Klin., Dec. 21, 1924). The condition generally occurs in young girls or women of fair complexion, often after exposure to cold. Appendicitis or cholecystitis is simulated by the high fever and abdominal rigidity, but a distinction may be made on the base of the lower pulse-rate, quieter breathing and less disturbed expression. In  $\frac{2}{3}$ of the cases the right kidney is the one involved. Herpes is often present, the spleen enlarged, and the lumbar region on the affected side slightly edematous. Further diagnostic data may be afforded by study of the urine and blood and by blood culture. In the treatment, the writer recommends intravenous injections of 5 c.c. (80 minims) of a 20 per cent. solution of hexamethylenamin on alternate days, daily bowel irigations, and morphine for pain. In severe cases repeated lavage of the renal pelvis, with or without vaccine therapy, may be required.

CYSTOSCOPY.—A plea for more widespread use of the cystoscope is made by P. S. Pelouze (Med. Jour. and Rec., Oct. 1, 1924). The real

value of the cystoscopy of today, he feels, is little appreciated by the greater number of physicians. There are many towns with neither a cystoscope nor a cystoscopist, in which bladders are nevertheless opened and kidneys operated upon many times each year. The writer cites 8 cases in which unfortunate results could have been avoided by a timely cystoscopy. One patient sought treatment for profuse hematuria, but was not cystoscoped, and 10 years later was found to have a large carcinoma apparently secondary to an earlier bleeding papilloma, from which he died. A woman had been treated 5 years for cystitis before cystoscopy was done, revealing a contracted tuberculous bladder secondary to an almost functionless tuberculous kidney; removal of this kidney was followed by partial recovery from the bladder condition. To the objection that cystoscopy is an ordeal to the patient, the writer replies that in the majority of patients it is no more painful than the passage of a metal sound. In no place in the human body are subjective and objective symptoms more often misleading than in urogenital conditions. modern methods the margin of error is reduced as low as 2 per cent. Cystoscopy is indicated in almost every chronic disease of the genitourinary conducting structures, in every case of hematuria, most cases of pyuria, and whenever a safe diagnosis of surgical renal disease is to be made. The contraindications to it are few: Very acute inflammation of the lower tract, particularly gonorrhea; advanced lung tuberculosis; severe chronic nephritis, and any low physical states.

The following points bearing on the importance of cystoscopy are presented: Cystitis is almost always a symptom, not a disease. quency of urination, hematuria or pyuria is often the 1st symptom of grave disease. Renal tuberculosis is usually called cystitis for several years. Pyelitis is often a transitional stage in pyonephrosis. Ureteral calculi often lead to useless appendec-The classic symptoms of tomies. vesical stone are oftener due to tuberculosis or papilloma than to stone. Vesical papillomas are potentially malignant but cystoscopically curable. Palpation in renal disease is a fertile source of diagnostic error; the hypertrophied sound kidney is more apt to be felt than the diseased one and just as likely to produce pain. Middle lobe prostatic hypertrophy cannot be felt per rectum. Vesical tabes gives all the symptoms and signs of prostatism in the absence of any obstruction at the vesical outlet. Few, if any, of the above diagnostic problems can be solved without cystoscopy.

TECHNIC.-In the presence of pus and blood, which interfere with proper visibility in cystoscopy, W. E. M. Wardill (Lancet, Jan. 26, 1924) injects 8 to 10 ounces of warmed sterilized liquid petrolatum through the catheter after the bladder has been washed out in the usual way. The cystoscope is then dipped into the liquid petrolatum and introduced, and the examination of the interior of the bladder carried out. The oil, being immiscible with the water of the urine, remains clear and transmits the light rays without interference from the pus and blood, which drop to the most dependent part. Any obscurity of the lowest portion of the bladder is overcome by changing the position of the patient.

A modification of the procedure of chromocystoscopy is recommended by F. C. Nesbit (Jour. Med. Assoc. of Ga., Sept., 1924), the

purpose being to avoid the invisibility of the bladder which soon results from the mixture of the indigo-carmin with the urine, in the original procedure. In the modified method 1 c.c. of phenolsulphonephthalein solution is given intravenously and the bladder distended with 4 per cent. sodium bicarbonate solution. The ureteral orifices are carefully watched for the expected spurts of pink urine, for the latter is soon decolorized by the alkaline urine, thus avoiding the accumulation of coloring matter in the bladder and resulting obscurity of its walls.

## D

DACRYOCYSTITIS.—Congenital dacryocystitis, as described by L. W. Crigler (Jour. Amer. Med. Assoc., July 7, 1923), is actually congenital only in the sense that there has been a delay in the process of canalization of the lacrimal passageways. The condition is essentially an infection of retained excretions from the conjunctival sac. There is usually no history of pain, redness or swelling.

A simple form of treatment, which was uniformly successful during 7 years, is mentioned by the writer, who believes that the probe should never be used except as a last resort. The lacrymal sac is 1st allowed to become fully distended, argyrol solution being meanwhile dropped into the cul-de-sac 3 times daily to prevent infection of the eyeball. The curative procedure is begun by placing, e.g., the right thumb over the right lacrymal sac in such a way as to shut off the return flow through the punctum, the infant's head being held between the surgeon's knees. The thumb is held sidewise, with its nail outward and its edge pressed downward over the punctum. The thumb is now rotated to the right, at the same time pressing downward, abruptly, over the sac. As a result, the sac gives way at its weakest point, viz., the site of the nasal opening.

DEAFNESS. -In a careful clinical and laboratory study of 44 cases of otosclerosis, from the particular standpoint of possible endocrin disturbance, D. W. Drury (Boston Med. and Surg. Jour., June 12, 1924) was led to recognize 59 per cent. of the cases as having an endocrin element, comprising pituitary disturbance in 20.6 per cent.; gonad (ovary), 13.6 per cent.; thyroid, 6.8 per cent., unclassified (insufficient data), 18.2 per cent. The results from corresponding specific glandular medication were definitely encouraging. The single illustrative case given is that of a woman of 28 years, with progressive deafness, tinnitus and moderate vertigo, gaining in weight and showing glycosuria on 20 Gm. of galactose, in whom ovarian extract led to marked improvement in 3 months. In hypothyroid cases the Eustachian tube and nasopharyngeal mucosa seemed much swollen. Among the endocrin cases as a whole, failing memory was often noticed, with dullness, difficulty in concentration, and sometimes irritability and restless-

Airplane deafness, as pointed out by V. T. Scott (Milit. Surgeon, Mar., 1923), is due not to air pressure changes, but to the explosions of the motor, and lasts 1 to several hours according to the length of the flight.

The best procedure for its prevention is to sew 2 ladies' powder puffs withmen the earflaps of the helmet, making certain that they shall fit snugly over the ears. The puffs should be of wool or cotton and wool, as puffs of cotton alone soon flatten under pressure.

In 2 cases of incipient catarrhal deafness before puberty, M. Yearsley (Lancet, Dec. 2, 1922) succeeded in arresting the disorder by performing a submucous resection, in spite of the youth of the patients. Stress is laid on acidity of the nasal secretions as a source of disturbance through irritation of the mucosa of the nasopharynx. Chronic middle ear catarrh first develops on the side upon which the patient lies at night, with consequent deafness. In operated cases the reaction of the nasal secretions was observed to become alkaline after the intervention.

TREATMENT.-From this standpoint 4 types of deafness are recognized by H. Hays (N. Y. State Jour. of Med., Apr., 1923): (1) Adhesive processes in the middle ear. These are usually treated by politzerization or catheterization; in certain cases vibrations are useful. The general condition, if poor, must be brought up to par. (2) Relaxation of the drum, due mainly to improper blowing of the nose; the patient is instructed how to avoid excessive forcing of air into the ear. Adjunct measures comprise painting the drum with cantharidal collodion and the use of artitificial ear drums, which are useful in some cases. (3) Nerve deafness, which is beyond correction by medical means. (4) Suppuration in the middle ear. Of these cases 90 per cent, are curable by medical measures; the other 10 per cent. require a radical mastoid operation. It is in cases with marked destruction of the drum and ossicles that artificial ear drums are most helpful.

According to F. P. Emerson (Ann. of Otol., Rhinol. and Laryng., Sept., 1924), the etiology of nerve deafness and so-called middle ear deafness is the same, and they are usually associated. There is no way of differentiating so-called perception and conduction deafness; the perception apparatus is involved from the 1st in all cases. Chronic deafness never progresses steadily, but in exacerbations. Even in long-standing cases removal of the local focus is often followed by improved hearing, without treatment of the ossicles or conduction apparatus; this occurs both in cases diagnosed as chronic catarrhal otitis media and in so-called nerve deafness. Removal of the focus may involve radical removal of the various tonsils and of adenoids, extraction of teeth and complete removal of sinus lining membranesthe latter a sine qua non to clearing up of the condition. Upon removal of the primary focus, if the patient has been subject to definite exacerbations ("colds"), the hearing will improve for 3 weeks without any treatment, but any further improvement must be gained by removing residual infection in the nasopharynx and especially Waldeyer's ring and the Eustachian tubes. Pilocarpine hydrochloride, ½ grain (0.01 Gm.) subcutaneously, is capable of improving bone conduction. In the 1st stage of involvement of the Eustachian tube, hearing may be restored to normal by opening of the tube with 4 per cent. cocaine solution on a cottontipped applicator through a silver catheter and the use of fresh 20 per cent. argyrol solution twice a week. In the 2d stage, added flooding of the tube with colloidal silver solution through a flexible catheter at every 3d or 4th visit is helpful. In the 3d stage of fibrosis, 2 applications of 3 per cent. tincture of iodine, with occasional floodings with the silver, will assist in arresting further loss of hearing. After surgical treatment of the tonsils, sinuses or teeth, the remaining lymphoid tissue at the base of the tongue and pyriform sinus needs careful follow-up treatment. All cases are benefited by eliminative treatment, changing the bacterial flora in the intestine, and treatment of anemia.

Small doses of X-rays, applied over each ear, the occiput and the open mouth, used 2 or 3 times weekly for 3 to 6 weeks, were found useful in many instances by J. McCoy (Amer. Jour. of Roentg., Mar., 1923). In chronic catarrhal otitis media the results as regards hearing were: Greatly improved, 9 cases; slightly improved, 19; not improved, 7. A decidedly greater patency of the Eustachian tubes was noted in all cases with a tendency to stenosis, and tinnitus was stopped in 6 and alleviated in 10. D. C. Jarvis (*Ibid.*) deems the X-ray treatment most useful in patients between 25 and 50 years who seem subject to frequent head colds, with catarrhal discharge from the throat and at intervals a stuffiness in the ears together with head noises. One-minute exposures are used.

> In cases with a high degree of deafness and loss of much of the tympanic membrane, Sir James Dun

das-Grant (Lancet, Nov. 18, 1922) recommends an artificial ear-drum made of a wisp of long-fibered absorbent cotton, the ends of which are pulled to a point. A piece of fine thread is tied at the middle, the fibers spread out radially, and their tips turned under to form a flat, springy cushion of the size of a shirt-button. This is seized at the thread with forceps, dipped into menthol in parolein, 1 grain (0.06 Gm.) to 1 ounce (30 c.c.), and inserted into the ear, as nearly as possible over the stapes. The hearing is tested by speaking softly and pressing with varying force until the spot is found at which the hearing is improved. This device gives help in many cases of deafness which have seemed hopeless.

DEMENTIA PRECOX.—According to H. Claude, A. Borel and G. Robin (Encéphale, Mar., 1924), 3 stages are generally discernible in the development of this disorder: (1) Kretschmer's schizoid predisposition not actually an abnormal state; (2) after certain exciting causes, schizomania, i.e., a loss of touch with reality, the subject living an introverted, autistic life; (3) true dementia, with "dislocation" of the mental functions, complete maladaptation of the individual, and disintegration of the intellectual, emotional and volitional functions. The disorder may follow a rapid course from the start, or the 3d stage may not develop until late in life, or be never reached.

In sex studies in 325 male patients, C. E. Gibbs (Arch. of Neur. and Psych., Jan., 1923) found evidences of a disturbance in sexual development and a failure of sexual maturity, most marked in patients admitted to the hospital during the years of puberty and adolescence. Such patients gave the impression of an un-

evenness of sexual growth, the secondary sex characters lagging behind the development of the testes. Only 20.5 per cent. of the cases had reached an adult level of sex behavior and maintained it for even a short time, either married or single.

N. D. C. Lewis (South. Med. Jour., May, 1923), in postmortem studies, found evidence of a congenital disturbance of the circulatory and lymphatic The average weight of the heart was 1/3 less than normal, irrespective of the size of the body. Pronounced changes in the cortex of the adrenals were as constant a feature as regressive atrophy of the testes; in 50 per cent., there was definite arrest of the cortical development. Accessory adrenals were frequently found. The thyroid gland showed changes in its connective tissue and colloid components suggesting a functional association with the gonads.

Among other laboratory findings in 107 cases, C. W. Sawyer (Ohio State Med. Jour., Sept., 1923) found the hemoglobin below normal in 81 per cent. and the systolic blood-pressure below normal in 69 per cent. The Wassermann was positive in 31 per cent. Indicanuria was found in 83 per cent. and diaceturia in 66 per cent.; this suggests an autotoxic basis for the disease or some autotoxic complication.

DIAGNOSIS.—This requires, according to R. S. E. Murray, of the National Military Home of Indiana (Clin. Med., Aug., 1924), a careful investigation of 4 sources of information—the family history, case history, mental state and physical state (including laboratory procedures), the relative value of which he would express, respectively, as 10, 15, 25 and

50 per cent. The family history is of less significance than was formerly supposed. Great family longevity is a useful negative indication. In the mental examination the Binet-Simon, Yerkes-Bridges and other intelligence scales are useful. The examiner should endeavor to establish the cause of the insanity as psychogenic or somatogenic; the former group is, according to prevailing tendencies, becoming smaller. The physical examination should embody a detailed, analytic inquiry into all the systems of the body, including study of the reflexes, alternations in skin sensations, otoscopy, ophthalmoscopy, chest work, dynamometry, blood-serum and spinal-fluid work, uranalysis, X-ray and bacteriologic studies, basal metabolism, gastrointestinal and blood chemistry, pathology and electrocardiology. teeth should be X-rayed, sinuses examined, head skiagrams taken, and prostates milked in all venereal suspects. Removal of infected teeth and tonsils may promote improvement or a return to health. If not, the infection may have passed to the stomach or intestines, calling for fractional gastric analysis, X-ray work or gallbladder drainage as aids in identifying the location of the focus. With infected discharging sinuses, sloughing tonsils, venereal disease or other pathologic states, dementia precox should not be the diagnosis until the effect of these various conditions has been carefully ascertained. modern diagnostic procedures, the diagnosis of dementia precox should attach to a rapidly diminishing group of cases of unknown pathology.

TREATMENT.—Little that is new has appeared of late on this

topic. According to H. Josephy (Deut. med. Woch., Aug. 22, 1924), intramuscular injections of the patient's own blood are of benefit in acute stages of the disease.

R. S. Carroll (N. Y. Med. Jour., Oct. 3, 1923) found that intraspinal injection of inactivated horse serum in such amounts as 25 c.c., after removal of an equal amount of cerebrospinal fluid, induced temporary or permanent mental lucidity in every case treated. The number of injections, which were given at weekly intervals, ranged from 2 to 5. The procedure causes an aseptic meningitis of safe grade, as proven by injection of relatively much larger amounts in animals. The best responses were in patients whose cerebrospinal fluid showed the largest percentages of eosinophiles. In early cases the appreciation of reality always developed by the 3d or 4th injection. The most permanent response was seen in cases with catatonic symptoms of 4 to 6 months' standing.

> B. Ferguson (Lancet, Feb. 24, 1923) reports a case-without definitely asserting it to be 1 of dementia precox -featured by increased knee-jerks, inability to fix the attention or carry on connected thought, recurrent headaches, outbursts of temper from trivial causes, sleeplessness and a tendency to draw obscene pictures. A diagnosis of dementia precox was made by Uhrstein and others. Exercise, cold baths and testicular extract afforded no improvement. In view of the advanced intestinal stasis of long standing, a tablespoonful of liquid petrolatum night and morning was ordered, with the result that marked betterment and ultimate restoration to health (upon 11 months' use of the lubricant) took place. Interruption of treatment led to recurrence of symptoms, which disappeared anew upon its resumption.

**DENGUE.**—From a study of 565 cases of this disease seen in Galveston, L. Rice (Amer. Jour. of Trop. Med., Mar., 1923) states that the diagnosis is best founded on 5 features: (1) Sudden onset with fever and a chill or chilly sensation; (2) aching pains, general or localized in the head, back or legs; (3) suffused face and eyes; (4) normal or low leukocyte count with relative lymphocytosis; (5) absence of jaundice and albuminuria. Besides these rather constant manifestations, there are usually noted soreness of the eyeballs and skeletal muscles, prostration, anorexia, and alteration of taste. The symptoms should be confirmed by the appearance of a toxic rash, defervescence within 3 to 7 days, and the absence of any other disease to account for the symptoms. Convalescence is attended with weakness and muscular soreness for 1 to 6 weeks. The treatment comprises salicylates, acetphenetidin and codeine sulphate for the pain, sponges, ice-caps, free intake of fluids, laxatives and rest in bed. All cases should stay abed for 2 or 3 days after defervescence.

As characteristic features of dengue T. Kaku (Deut. med. Woch., Apr. 6, 1923) lays stress on combination of the rash with herpes and a free V-shaped area between the scapulæ. Joint pains, stopping very quickly, and loss of sensation of the skin of the limbs are pathognomonic manifestations.

**DERMATITIS.**— Bakers'. — This condition may, as stated by A. C. Parsons (Brit. Jour. of Derm. and Syph., May, 1924), usually be ascribed to chronic irritation from dough. The lesions are on the upper

limbs, especially the backs of the hands and the ulnar region of the forearms. There is 1st itching and erythema, then often a vesicular rash and, in untreated cases, sooner or later a general folliculitis. In the treatment, mild astringents with antiseptic ointments, calamine lotion and malachite green have all been successful, provided the patient refrained from handling dough. In intractable cases a change of occupation should be advised. De Jong (Lancet, May 5, 1923) suggests that salt in the dough is the actual cause of the dermatitis.

Diphtheritic.—Greenbaum (Amer. Jour. Dis. of Childr., July, 1924) reports a case treated for nearly 3 weeks for eczematized impetigo of the left lower lid and both cheeks, with fissures at the buccal commissures and nasal alæ. Suspicion was aroused by the failure of the remedies usually specific in impetigo, and cultures from the fissures were positive for diphtheria bacilli. Diphtheria antitoxin, 3000 units intravenously, led to a 90 per cent. improvement in 24 hours, with ultimate recovery.

Exfoliative.—In a case reported by J. E. Fisher and S. S. Wittenberg (Arch. of Derm. and Syph., Sept., 1924), the exfoliative eruption appeared on the 6th day after birth and death occurred on the 3d day of the disease. The mother was unaffected. Serum from the child's bulle, collected aseptically, yielded a shortchain streptococcus.

Geranium.—J. W. Anderson (*Ibid.*, Apr., 1923) reports what is said to be the 1st recorded case of vesicular dermatitis due to contact with the leaves of the geranium. Parasiticides as the cause were excluded.

Herpetiformis. — Disturbance of the sympathetic system is regarded by Golay (Rev. méd. de la Suisse rom., Jan., 1925) as the source of this disease on account of the following features presented by the case he describes: Preëruptive nature of the itching; the extraordinarily symmetric distribution; the hyperidrosis, and the exacerbations at menstruation. The case was improved by autoserum injections and later by protein therapy.

Lacquer.—Several authors have reported vesicular eruptions and edema of the face, neck, hands and forearms due to contact with the lacquer on boxes containing mah jong sets. In the case recorded by E. P. Zeisler (Jour. Amer. Med. Assoc., Feb. 9, 1924), the source was proven by applying some of the scraped-off lacquer to the unbroken skin of the patient's leg, causing a vesicular dermatitis in this area within 24 hours.

Match-box.—This condition is due, according to O. H. Foerster (Jour. Amer. Med. Assoc., Oct. 6, 1923), to phosphorus sesquisulphide, which, when near the skin, with the special conditions of heat and moisture, develops irritant properties. It occurs perhaps most often on the thigh, and passes from an erythema to a papular eruption, edema, exudation and lichenification. It subsides promptly under local applications of boric acid solution or simple protective oint-Contact with match-boxes or matches must be avoided even for several months after the dermatitis has disappeared.

Medicamentosa.—A case of dermatitis due to mercury is reported by H. P. B. Jordan (R. I. Med. Jour., Jan., 1923). Blue ointment had been applied freely to various areas on ac-

count of pediculosis pubis. A very widespread pustular eruption, in many areas confluent, resulted, and the patient was deeply prostrated for 8 days. Profuse desquamation followed. In a case recorded by J. Becker (Zeit. f. Kind., June 16, 1924), a scarlet, scaly erythema extending from the left inguinal fold almost to the costal arch was traced to some metallic mercury preserved under the back cover of the patient's watch. In a case of local dermatitis due to a mercurial plaster, Nicolau (C. r. Soc. de biol., Dec. 19, 1924) finally obtained desensitization of the affected area with 3 X-ray treatments, to a total of 5 skin units.

Phenolphthalein eruptions are discussed by W. H. Hailey (Jour. Med. Assoc. of Ga., May, 1924). The lesions resemble wheals, with a color varying from pink or red to slate, and usually appear on the lips, genitals and covered portions of the body. They range in size from a pinhead to a powder puff, may ooze or become eroded or ulcerated, and leave a brownish pigmentation. About 40 or 50 proprietary laxatives contain phenolphthalein. Addition of a weak NaOH solution to the suspected drug yields a pink color.

Pyogenic.—In various eruptions of pyogenic origin, lotions of potassium permanganate, zinc or copper sulphate, or mercury bichloride, frequently yield decisive effects, according to F. Balzer (Paris méd., Feb. 28, 1925). Recurring furunculosis is checked by repeated antiseptic applications. Dressings of 1 to 2 per cent. permanganate solution are useful in infected lupus. In extensive chronic eczema, scaly and itching, in which secondary pyogenic infection always

exists, 1 or more weak permanganate baths give marked relief and enhance the effects of other local medication. During mercurial or arsenical treatment there arise erythemas and erythrodermias that are often coupled with various kinds of pyogenic lesions, developing either through added local infection or from the germs already present in the skin. As this complication may become serious and even fatal, there is great advantage in using permanganate baths from the outset. In the intervals, the epidermis should be dried out with a mixed powder of talcum and zinc oxide. In exfoliative dermatitis of the newborn, as well as in adults, antiseptic baths are useful; in obstinate cases, permanganate baths may be alternated with oak bark baths. In bullous disorders with secondary infection the antiseptic solutions used should be weak; in severe bullous cases, 1 kilogram (2 lbs.) of oak bark may be added as a decoction to the bath, or tannic acid may be used. In a case of acute generalized lichen the writer had success with an emulsion of codliver oil-100 Gm.  $(3\frac{1}{3})$  ounces) added to the bath. In frostbite, immersion in a 2 to 5 per cent. solution of calcium chloride has been advised. The amount of permanganate generally used by the writer in an antiseptic bath is 5 or 6 Gm. (75 to 90 grains); for a strong bath this is increased to 10 to 25 Gm.  $(2\frac{1}{2}$  to  $6\frac{1}{4}$  drams).

On the basis of Besredka's view of the importance of the skin in active immunization, Lorthioir (Arch. francobelges de chir., Mar., 1924) applied dressings wet with staphylococcus vaccine over staphylococcic skin disorders in children. Recovery was more rapid than under any other procedure, the appearance of the lesions

being already greatly improved on the 2d day.

Rhus (Poison Ivy and Poison Oak).—Rhus radicans or toxicodendron (poison ivy) is closely related botanically to the Rhus diversiloba (poison oak) of the Pacific slope, the latter, however, often forming thickets 6 feet high or more, rising from the ground without outside support. The leaflets are in groups of 3, whereas the harmless woodbine has 5 leaflets. C. M. Williams (Med. Jour. and Rec., June 4, 1924) endorses, as the simplest treatment, that which consists of repeated washing with running warm water, using plenty of soap and a scrubbing brush, gauze or absorbent cotton. If running water is not available, the water in the basin must be changed repeatedly and frequently. The brush must also be washed repeatedly with soap and warm water in the course of the treatment, and the gauze or cotton frequently replaced with fresh pieces. If this is done within a few hours after exposure, even a susceptible person will escape, and the treatment will abort the attack in the vast majority of cases, unless already established and severe. Acree and Syme have recommended early and repeated treatments of 1 or 2 per cent. potassium permanganate solution, especially if hot and containing a little sulphuric acid.

Brilliant results are obtained, according to Williams's experience, with Strickler's method, described thus: For immunization 4 intramuscular injections of 0.3 to 0.5 c.c. each of rhus antigen are given at intervals of 3 or 4 days. After the last dose the patient takes by mouth 5 to 10 drops of tincture of rhus, well diluted,

3 times a day, after eating, for 1 month. In the treatment of an attack, 0.3 to 0.5 c.c. are injected on 2 successive days, to be followed, if necessary, with 2 or 3 more injections of 0.3 to 0.7 c.c. at intervals of 2 or 3 days.

In the majority of cases, a sufficient treatment is to wash thoroughly, as described, after every exposure, and also on the 1st appearance of the eruption, taking, in the latter case, 3 drops of tincture of rhus 3 times a day. In the more severe types, and in the milder cases which grow worse in spite of washing and the tincture, both the antigen and the tincture should be used.

DIABETES INSIPIDUS.—According to K. Motzfeldt (Norsk Magazin f. Laeg., Sept., 1924), there is little chance of a cure unless doses of pituitary extract much larger than those hitherto used are given. The treatment can be continued for months without toxic effects. Intravenous administration should be avoided, as it may induce fatal collapse. He observed good results from the daily ingestion of 7 fresh beef pituitaries.

The 1st case on record treated by X-ray exposures of the pituitary is reported by E. B. Towne (Jour. Amer. Med. Assoc., Dec. 27, 1924). Early pituitary tumor was diagnosed on account of a constant visual field defect in the right upper temporal quadrant. Eleven series of X-ray cross-fire treatments in the course of a year resulted in return of the visual fields to normal, a drop of the urine output to 2.5 liters—at which it has remained over 3 years,—and transformation of a totally incapacitated man into an efficient wage-earner.

Castellano and Schteingart (Prensa med. Argent., Mar. 20, 1924) report 2 cases of clinical recovery under antisyphilitic treatment, although the Wassermann was negative. Slight changes suggesting neurosyphilis were found in the cerebrospinal fluid.

Sajous (Amer. Jour. Med. Sci., May, 1924) has used with success a combination of hypophysis sicca, ½0 grain (0.006 Gm.), and ergotin, 1 grain (0.06 Gm.), in a capsule 3 times daily.

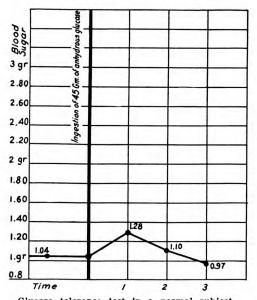
Summarizing the treatments used in 37 cases at the Mayo Clinic, Rowntree (Jour. Amer. Med. Assoc., Aug. 9, 1924) states that consistently good results were obtained only from frequent subcutaneous injections of posterior pituitary extract, though in a few cases effects of considerable value were obtained from its intranasal use as a spray, instilled into the nostril by a medicine dropper, or applied on a pledget of cotton. When obstetrical pituitary extract was not sufficiently effective, the surgical extract proved more satisfactory. Rectal administration was sometimes helpful, but only for short periods, usually 2 to Water in excess after 4 hours. pituitary administration resulted in symptoms of water intoxication. Spinal puncture, tried in 19 cases, yielded only moderate reduction of symptoms for 2 or 3 days in 2 or 3 cases. Vigorous antisyphilitic treatment had no effect except, perhaps, in 1 instance. In cases secondary to neoplasm, operation should be considered on its own merits, without reference to the diabetes insipidus. Much can be accomplished in allaying the patient's apprehension, especially in idiopathic cases, by assurance that he has nothing more to fear than the discomfort and inconvenience of the disease. Of 56 cases, 8 died, 3 were cured, 8 were definitely improved, 9 unchanged, 5 continued daily injections and 8 were untraced.

A pituitary tartrate, or new preparation of the active principle of the posterior lobe, was made and used by J. J. Abel and E. M. K. Geiling (Jour. of Pharm. and Exp. Ther., Nov., 1923) in 4 cases of diabetes insipidus, with results similar to those obtained with the ordinary pituitary products. The preparation is effective by the nasal route in a dosage of 4 drops of a solution of 0.5 mgm. (1/130 grain) per c.c. (16 minims) of water in each nostril every 3 hours.

DIABETES MELLITUS.— **DIAGNOSIS.**—A positive diagnosis in early or borderline cases of diabetes is difficult, and at the same time a mistaken diagnosis is fraught with an unusual element of risk or unnecessary misery for the patient. Dependence cannot be placed on uranalysis alone, nor even on a single blood-sugar examination. As emphasized by H. J. John (Amer. Jour. Med. Sci., Aug., 1923), the essential point to be established is the ability of the individual to utilize (metabolize and store) carbohydrates. This calls for a progressive study of the blood sugar content, i.e., the establishment of a glucose tolerance curve. This curve discloses, furthermore, whether the individual may or may not be apt to develop diabetes, and is thus a valuable guide in prophylaxis.

M. Labbé (Bull. de l'Acad. de méd., Oct. 21, 1924), in performing this test, makes a 1st determination of the blood sugar (by a modification of Bang's micromethod) while the subject is fasting, then gives 50 Gm. of pure plucose dissolved in water and

determines the blood sugar every ½ hour for the next 3 or 4 hours. The results are plotted out in such a manner that every centimeter of the ordinate represents 1 Gm. of sugar and every centimeter of the abscissa, 1 hour of time. The curve obtained is roughly a triangle, the area of which is an expression of the results of the test. In normal subjects the area measures but 0.2 to 0.4 centimeter square, while in diabetics it measures



Glucose tolerance test in a normal subject.
(Labbé.)

from 1 to 7 centimeters square, averaging 3. Urine is also collected every ½ hour if possible, the patient being given a glass of water every hour to promote urine formation, and the results noted in a separate curve on the chart.

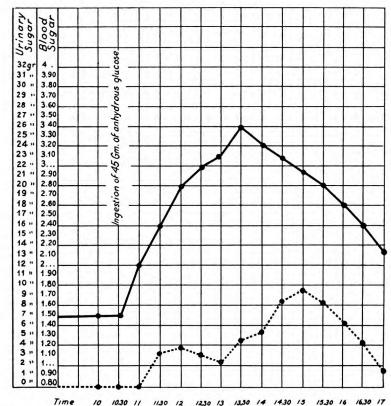
Aside from the normal and the diabetic curves, Labbé recognizes also a group of intermediate cases with responses measuring 0.6 to 1.5 centimeters square, in which the moderate increase of blood sugar may be due to 1 of many different conditions,

such as obesity, liver disorders, high blood-pressure with or without nephritis, hyperthyroid states, and acute infectious diseases. In this intermediate group the glycosuria constitutes a "paradiabetic state," which is sometimes rather hard to differentiate from diabetes. As the 3 groups occasionally overlap - exophthalmic goiter, e.g., showing as high as 3.87 and true diabetes as low as 1 or 2,—the results of the test are always subject to an added clinical interpretation. Nevertheless, the test is of value in the recognition of latent diabetes, as in cases properly treated and with a carbohydrate tolerance approaching the normal; in persons who attempt to conceal their diabetes by rigid dieting; in obese cases with slight glycosuria which may or may not be diabetic, and in children in whom a glycosuria yielding to diet has led to the suspicion of a serious form of disturbed glycoregulation. Again, the glycosurias related to functional hepatic disorder are often very difficult to distinguish from diabetes. Thus, there are many obese individuals with enlarged livers who are wrongly considered diabetics and inconvenienced by strict diets of which they are not in need; others, actually diabetics, are not regarded as such, with the result that their diabetes gets worse. In these the test is of service, as also in renal diabetes attended with hyperpermeability of the kidneys to glucose; in 5 of the latter cases the writer was enabled, by noting a normal response to glucose, to exclude true diabetes.

A blister test for the study of sugar accumulation in the tissues is described by Gänsslen (Münch. med. Woch., Aug. 3, 1923). A vesicant

plaster measuring 2 by 3 centimeters is placed at night on the outer aspect of the leg or arm, and the fluid withdrawn the next day and tested for sugar. Passage of sugar into the tissues after intravenous injection of it can thus be demonstrated. In pan-

resort to the following procedure as an inferior, though serviceable, substitute, having for its purpose to demonstrate the faulty storage of carbohydrates occurring in diabetes mellitus: The patient empties his bladder at



Blood sugar 1.48 1.48 27 2.40 2.85 3.02 3.08 3.40 3.20 3.08 2.95 2.89 2.64 2.40 2.45 Urinary Sugar ogr ogr ogr 3gr20 3.55 3gr 2.55 4.48 5.40 8.60 9.60 8.40 6.40 4.20 1.38

----- Urinary Sugar G
----- Blood Sugar

Glucose tolerance test in a diabetic patient. (Labbé, in Bull. de l'Acad. de méd.)

creatic diabetes the sugar content was found higher in the blister fluid than in the blood, while the converse was true in mild, temporary glycosuria. In wasting diseases, grave exophthalmic goiter and late pregnancy the sugar content proved to be abnormally low.

Where blood examinations cannot be carried out, E. G. B. Calvert (Lancet, June 28 and July 5, 1924) 6 A.M. Specimen A of urine is collected between 6 and 8 A.M., before breakfast. At 8 A.M. a carbohydrate breakfast is given consisting of 30 to 50 Gm. of glucose, or  $1\frac{1}{2}$  to 2 ounces of cane sugar, or 3 to 4 ounces of white bread. Specimen B is collected by thoroughly emptying the bladder 3 hours later, at 11 A.M., and Specimen C, 1 to 2 hours later, before

the next meal. Normal storage (as in renal glycosuria or "lag" glycosuria, in which the blood sugar rises above a normal threshold but returns to a resting level within 2 hours) is present (a) if there is no sugar in A or C, or (b) if small and practically equal amounts of sugar appear in A and C and are uninfluenced by increasing the carbohydrate taken, and B remains unchanged. Deficient storage is suspected (a) if the sugar concentration in A exceeds 1 per cent, and the amount of sugar in C exceeds that in A, or (b) if there is no sugar in A but some in C, or (c) if there is no sugar in A or C even when a larger dose of carbohydrate has been taken, but the amount in B has appreciably increased.

Absence of a febrile reaction to the introduction of foreign proteins was observed by G. Diaz (Med. Klin., Jan. 11, 1925) in many diabetics, as Schmidt had already noticed, and is regarded as of some utility in the early diagnosis of the disease. This peculiarity was also found often in the descendants of diabetics, in conjunction with a low sugar tolerance.

PROGNOSIS.—According to H. Gray (Amer. Jour. Med. Sci., July, 1924), of Joslin's clinic, blood fat analyses are a material aid in the diagnosis and especially in the prognosis of diabetes mellitus. The blood fats in diabetes are abnormal with nearly the same constancy as the blood sugar. Most long-lived diabetics show blood fats below 1 Gm. per 100 c.c. By blood fats the writer means those substances determined by Bloor's method for so-called "total fat," viz., fatty acids plus total cholesterol but not lecithin. Among 1062 blood samples from 588 patients, the blood fats exceeded the normal maximum (0.67 Gm. per 100 c.c.) in 78 per cent., as against abnormal blood sugar (above 0.11 Gm. per 100 c.c.) in only 72 per cent. In treated cases the blood fat seems, for diagnosis, to be somewhat superior to the blood sugar, showing greater stability. As regards prognosis, the blood fats were found related to the periods of survival as follows: 0.79 Gm., 4 years or more; 0.93 Gm., 2 to 4 years; 1.03 Gm., 1/4 to 2 years; 1.15 Gm., 6 months or less. Severe diabetics develop high blood fats simultaneously with emaciation, while under treatment a progressive fall of blood fat occurs, even when such treatment is based on the high fat diet. When the fat exceeded 2 Gm., the patient lived less than 2 years in 86 per cent. of cases.

TREATMENT.—It is generally recognized that in about 34 of all instances diabetes can be controlled by diet, without the use of insulin. As stated by Joslin (Jour. Amer. Med. Assoc., June 2, 1923), the successful treatment of this disease depends on adherence to a diet which will keep the urine sugar-free, avoidance of overnutrition or extreme undernutrition, and a method of life compatible with the strength such a diet affords. Calvert (loc. cit.) treats mild chronic or slowly progressing disease in patients with good nutrition by diet, most cases doing best on 0.3 Gm. carbohydrate, 0.7 Gm. protein and 1 Gm. fat per pound of body weight; this combination supplies 13 calories per pound. Due allowance is made overweight or underweight. Some cases of ketonuria clear up very rapidly on withdrawing most of the fat in the diet and subsequently reducing the carbohydrate and protein. The more usual method, however, is

to have the patient fast for 1 or 2 days, allowing a little nourishment if the urine does not become clear of sugar, and following this by another short fast. If sugar is still present it is well to build up the diet gradually, and then make another attempt to free the urine of sugar by fasting. When this is obtained, a gradually increasing dietary is given, with a fast every 7th day, until, in the course of 2 or 3 weeks, adequate nourishment is taken.

Newburgh and Marsh (Arch. of Int. Med., Apr., 1923) discuss in detail their high-fat diet, low in protein and carbohydrate, as applied by them in 176 cases. The object of the diet is to avoid the evils of undernutrition. The use of fat in large quantity proved to be safe, and the patients obtained 900 to 1000 calories a day, the standard maintenance diet being composed of protein, 55 Gm.; fat, 220 Gm., and carbohydrate, 35 Gm. Not only did none of the patients develop acidosis on the high-fat diet, but in those coming in with an acidosis short of coma, this acidosis disappeared on the diet. This method, the writers conclude, will keep the urine sugar-free and maintain the nitrogen balance, does not cause a hyperlipoidemia, supplies enough energy to permit of earning a livelihood, and is not attended by downward progress in uncomplicated cases.

A procedure whereby the diabetic patient can readily measure and follow the daily variations in sugar excretion is described by F. C. Eve (Brit. Med. Jour., Sept. 20, 1924). A pint thermos bottle is used, which the patient washes out with very hot water every night at bedtime. He then urinates into it, adds a piece of yeast of hazelnut size, shakes thoroughly, and stop-

pers with cotton. The specific gravity of the warm, freshly passed urine is determined with a urinometer and noted on square-ruled paper with a black dot; next morning the specific gravity of the same urine is taken and recorded with a red dot. The specific gravity after the fermentation overnight is reduced to an extent proportional to the amount of sugar present. The object is, by dietetic and insulin treatment, to make the space between the curve of the black dots and that of the red dots as small as possible.

INSULIN.—The influence already exerted by insulin on the mortality from diabetes is illustrated in a report by L. J. Palmer (Northw. Med., Oct., 1924) on the diabetes death rate in the state of Washington in recent years. From 19.0 in 1922, the rate dropped in 1923—the 1st year of limited insulin use—to 16.0, and in the 1st 6 months of 1924—during which insulin had been generally available,—to 9.0. Joslin (Jour. Amer. Med. Assoc., Sept. 6, 1924) characterizes insulin as "better than any of us thought a year ago." A coma patient in 1924 recovered far more surely and simply than in 1923. The country practitioner can put a catheter in the bladder and thus determine each hour, from urine examination, what the next dose of insulin should be. Insulin has clinched the proof that the patient with mild diabetes is often the one to fall into coma needlessly, and that diet alone is sufficient for a large proportion of diabetics in advanced life. About 1/4 of the writer's patients who take insulin later become able to leave it off and live comfortably on diet alone.

Banting (Proc. Internat. Conf. on Health Prob., 1924), presenting an outline for the physician of the principles underlying the use of insulin, recognizes in diabetes a vicious circle whereby the excessive hunger resulting from failure to burn sugar throws an increased strain on the insulin-producing mechanism, rapid emaciation therefore taking place in spite of the ingestion of quantities of food. The basal food requirement of the body is about 25 calories per kilo. of weight per day. Of protein, 2/3 Gm. per kilo, per day is required, and the remaining calories must be supplied by carbohydrate and fat in a ratio that will prevent the production of ketone bodies. The simplest method for determining the amounts of the 3 basal foodstuffs to give is that of Hipwell, in which the percentages of calories to be derived from protein, carbohydrate and fat are put down as 12, 13 and 75, respectively. By dividing the protein and carbohydrate calories by 4, and the fat calories by 9, the respective grams of each are obtained. Thus, if a patient weighs 64 kilos., the minimum caloric requirement is  $64 \times 25$ = 1600 calories. The diet prescription is, therefore:

Fat: 
$$75\% \text{ of } 1600 = 133 \text{ Gm.}$$

$$Carbohydrate: \frac{13\% \text{ of } 1600}{4} = 52 \text{ Gm.}$$

$$Protein: \frac{12\% \text{ of } 1600}{4} = 48 \text{ Gm.}$$

With these 3 amounts determined, the patient's diet is then compiled by the use of calorie food tables.

Patients should be thoroughly instructed, taught urinalysis, the calculation and preparation of a diabetic diet, and how to administer their own insulin and calculate its dose. They should be warned of the symptoms and treatment of overdosage. It is impracticable for the physician to treat and teach the patient unless he is in a hospital. Blood-sugar estimations are desirable, but not absolutely imperative if the urinary sugar is closely followed.

In the initial examination of the patient, attention should be given to the finding of a possible focus of infection. The tonsils, teeth, sinuses, chest and digestive system are examined clinically as well as by X-ray, and special consideration is given to biliary tract infection, constipation and chronic appendicitis. Such a focus, if found, should be suitably treated, as it may lower and unstabilize carbohydrate tolerance.

The patient is placed on the diet of basal caloric value for 3 or 4 days, or until the urine is sugar-free. The sugar excreted is estimated daily, and this, subtracted from the available carbohydrate ingested, gives approximately the utilization. available carbohydrate includes 56 per cent. of the protein, 10 per cent. of the fat and all of the carbohydrate in the diet. If the patient becomes sugar-free and "blood-sugar-normal" on the basal requirement diet, the caloric intake is gradually increased until sugar appears in the urine. The tolerance is thus ascertained. If a patient remains sugar-free and has a normal blood-sugar on a diet containing 700 calories above his basal requirement, the case is considered not sufficiently severe for insulin; otherwise, insulin treatment is commenced. The initial dose should not be more than 5 units twice a day. This can be gradually increased until the patient becomes sugar-free, the diet being kept constant. Roughly, each

unit of insulin causes 1½ to 2½ Gm. of carbohydrate to be utilized. The amount of utilization per unit is least in severe cases with high bloodsugar and during infection. The insulin is best given 20 to 30 minutes before the morning and evening meals, e.g., 15 units (hypodermically) before breakfast and 10 before dinner, the larger morning dose being intended to take care of the noon meal When the insulin dose and diet are balanced so that the bloodsugar is normal, they are concurrently increased until the required amount of food is reached.

An excessive dose of insulin causes a marked hypoglycemic reaction beginning in 1½ to 6 hours (average 3 to 4) and featured by an unaccountable anxiety, restlessness, often sweating, a great desire for food, and soon after, clonic tremor, impaired coordination, pallor, rise of pulse rate to 100 or 120 dilated pupils, faintness, and even aphasia, collapse, unconsciousness, convulsions and death. Ingestion of orange juice (4 to 8 ounces—120 to 240 c.c.), glucose or candy relieves these symptoms in 5 to 10 minutes. If coma or convulsions have occurred, adrenalin, 10 to 15 minims (0.6 to 1 c.c.), usually restores consciousness in 3 minutes, whereupon glucose should be given by mouth.

By careful adjustment of the diet and dose of insulin, all diabetics may be kept sugar-free. There is abundant evidence of regeneration of the islet cells when the strain thrown on them by a high blood-sugar is relieved. Increase in tolerance is evidenced by decreasing insulin dosage, and some moderately severe cases become able to dispense with the insulin. The proper burning of carbohydrates under insulin allows of complete oxidation of the fats, and acidosis disappears.

As emphasized by R. M. Wilder (Minn. Med., Sept., 1923), insulin given without precise control of both dosage and diet is worthless and even dangerous. The food must be weighed and the diet planned. The following initial food mixture is suggested: For each 10 kilos. (22 lbs.) of body weight allow 125 c.c. (4 ounces) of 20 per cent. cream, 75 c.c.  $(2\frac{1}{2})$  ounces) of skimmed milk, and the white of 1 egg; mix as for eggnog, add 1 to 2 drams (4 to 8 c.c.) of whiskey or 2 saccharin tablets (1 grain each), and divide into 3 equal parts. Chill and serve 1 part for each meal. When a table of food values is understood, other foods should be substituted for this mixture. sugar persists in the urine after 5 days, insulin should be started. Five units (0.25 c.c.) of H. 20 iletin may be given before breakfast, symptoms of shock watched for during the late morning, and orange juice given if needed. If glycosuria persists after 3 days, the insulin is increased to 15 units before breakfast, and, if necessary, to 25 units after another 3 days. Further injections, if required, should be given as separate doses just after lunch, 5 units being added each day until the urine is sugar-free. Usually 45 units daily suffice. The dose should be large enough to keep the urine passed between 7 and 9 P.M. sugar-free.

In striking the balance between food intake and insulin doses, L. T. Gager (Med. Jour. and Rec., Oct. 15, 1924) finds it advantageous to make the dietary factor the fixed or known

TREATMENT OF ACIDOSIS AND COMA.—When acetone bodies are produced more rapidly than they are excreted, they accumulate in the blood and give rise to air-hunger, drowsiness and coma. Insulin is then imperatively needed; when it is given, the utilization of carbohydrate by the body results in complete combustion of the fats, and acetone and sugar are observed to disappear from the urine almost simultaneously.

As observed by P. Starr and R. Fitz (Arch. of Int. Med., Jan., 1924), there are some cases of diabetes mellitus with severe acidosis without acetone bodies in the urine. Study of this matter showed that about 10 per cent. of diabetic urines contain organic acids other than acetone bodies in considerably higher than normal concentration. These cases appear to require alkali as urgently as insulin, if not more so, since the latter, while clearing up the acetone body acidosis, may not affect that due to other acids.

When a patient is admitted to hospital in diabetic coma, as described by Banting (loc. cit.), blood and urinary sugar and acetone estimations are made as soon as possible, the urine being obtained by catheterization, if Meanwhile, the large necessary. bowel is evacuated with copious enemas. If sugar and acetone are present in large amounts in the urine, 30 to 50 units of insulin are at once given subcutaneously. blood and urinary sugar should be frequently estimated, because of the danger of hypoglycemia. To prevent the latter, 30 to 50 Gm. (1 to  $1\frac{2}{3}$  ounces) of glucose in 10 per cent. solution may be given intravenously or by rectum. If the patient is profoundly comatose the insulin may be given intravenously with the glucose. He usually regains consciousness in 3 to 6 hours. From this time on fluids and glucose may be given by mouth, if retained. The patient should be urged to take at least 200 c.c. (63/3 ounces) of fluid per hour. Next day, protein may be given every 4 hours, e.g., the white of 1 egg in 200 c.c. of orange juice. In 2 or 3 days, when ketone bodies have disappeared from the urine, fat is cautiously added, and the patient is slowly raised to a basal requirement diet.

During coma, the patient is kept warm and purgation and repeated enemas given. Much fluid is administered—intravenously, subcutaneously or by rectum. Signs of circulatory failure are met by appropriate stimulation. Striking results follow such treatment, especially if begun early in coma. Cases complicated by severe infection, gangrene, pneumonia or intestinal intoxication may, however, recover from acidosis and coma but succumb to the complication instead.

N. B. Foster (Amer. Jour. Med. Sci., Nov., 1923) lays stress on abundance of fluids, given slowly through every avenue of absorption, and support of the circulation by digitalis and caffeine as important adjuncts of insulin in diabetic coma. The value of alkali therapy is a debated subject. Joslin does not think alkalies necessary, but the writer believes that on theoretic grounds there is ample basis for the giving of sodium bicarbonate, of which he administers a 3 per cent. solution along with glucose by rectal instillation and by the Murphy drip method.

**DIARRHEA.**—According to Boas (Deut. med. Woch., Oct. 13, 1924), calcium is superior to all other remedies. He uses calcium carbonate, preferably with an equal amount of calcium phosphate, in the dose of 1 teaspoonful 3 times daily. Among the forms of diarrhea thus benefited are those of exophthalmic goiter and sprue, the gastrogenous diarrhea of achylia, and the gastroenteritis of children. The action is pronounced only in catarrhal diarrheas, not in ulcerative processes; a successful result is diagnostic evidence of a catarrhal type of diarrhea. A suitable diet should, of course, also be prescribed, and in diarrhea of pancreatic origin pancreatic ferments should be Fürbringer (*Ibid.*, June 20, 1924) likewise reports excellent effects from teaspoonful doses of calcium carbonate, but warns that the drug must be stopped in time to avoid the formation of chalk scybala.

Escomel (Cron. med., Mar., 1923) describes a turpentine treatment for diarrhea as having cured 90 per cent. of all diarrheas of bacterial origin as well as all cases due to trichomoniasis. On the first 3 days the patient is given every 2 hours a spoonful of a mixture of 150 Gm. (5 fluidounces) of acacia solution and 12 Gm. (3 fluidrams) of paregoric with 2 to 4 Gm. (1/2 to 1 fluidram) of oil of turpentine. An evacuating enema of 1 or 2 liters (quarts) of a decoction of gambir or eucalyptus is taken morning and evening and followed by an enema to be retained, consisting of 4 spoonfuls of boiled water containing 1 yolk of egg beaten up with 20 to 40 drops of oil of turpentine and 10 to 25 drops of tincture of opium. In the way of food the patient is allowed only a glass of boiled fresh milk with 4 spoonfuls of lime water and a little potato or gruel every 3 hours, followed by a tablet of pancreatin and sodium bicarbonate, of each 0.2 Gm. (3 grains); pepsin, 0.4 Gm. (6 grains), and diastase, 0.1 Gm. (1½ grains). Rice water is used as beverage, and hot applications are made every 3 hours to the abdomen, which meantime should be kept covered with flannel. Rest should be ordered during the treatment.

In a case of chronic diarrhea reported by D. N. Silverman (New Orl. Med. and Surg. Jour., Apr., 1923), thousands of giardiæ (lambliæ) were found in the duodenal contents and were dispelled by 5 doses of silver arsphenamin totalling 0.7 Gm. given intraduodenally in the course of 4 weeks. The diarrhea did not cease, however, until pancreatin was also prescribed.

Diarrhea in cases of intestinal paralysis the result of peritonitis is discussed by A. Szenes (Deut. Zeit. f. chir., Feb., 1923). The malodorous diarrhea occurring in spite of evidences of colon paralysis indicates the small intestine is still active and that the paralysis is limited to the upper portion of the colon. Atropine is useful to reduce secretion and arrest liquefaction of the intestinal contents. Peristaltic drugs and enemas may be used, but enterostomy may be required in addition, preferably instituted at the most dependent point of the colon rather than the most distended loop, in order to take advantage of the effect of gravity in emptying the bowel.

INFANTILE DIARRHEA.—The summer diarrheas of children are best classified, according to C. M. Pounders (Arch. of Ped., Aug., 1924), as me-

chanical, proteolytic, fermentative and infectious. The first 2 constitute purely a problem in infant feeding. In the fermentative type, without involvement of the intestinal mucosa, the temperature is apt to be higher, with a decline after 4 or 5 days, while in the infectious type it is not so high but more prolonged. In the former type, the abdomen is commonly distended and the stools green, watery and acid to litmus, while in the latter type, the abdomen is usually flat or sunken, the stools containing pus and blood, and the reaction alkaline. In either type there should be initial purgation with 2 drams to 1 ounce (8 to 30 c.c.) of castor oil. If the oil is not retained, calomel should be given in \(\frac{1}{10}\) or \(\frac{1}{5}\) grain (0.006 or 0.012 Gm.) doses every 1/2 hour for 10 doses, followed in 3 hours by 2 or 3 teaspoonfuls of milk of magnesia. Food should be withheld for 12 to 24 hours, and meanwhile every effort made to supply the proper amount of fluid—2 to 3 ounces (60 to 90 c.c.) per pound of body weight every 24 hours. This should be given as barley water sweetened with saccharin or weak tea. Upon resumption of food the indication in the fermentative type is for a protein diet, fats being withheld for weeks afterward, while in the infectious type a carbohydrate diet is indicated, with little, if any, fats or proteins.

In a severe case of any type of diarrhea, according to B. G. Melle (Med. Jour. of So. Afr., Oct., 1923), the immediate treatment should be that for collapse. First a mustard bath is given and the patient stimulated with caffeine sodio-benzoate, 0.1 to 0.5 Gm. (1½ to 7½ grains)

subcutaneously or intravenously, or with camphor in oil, strychnine, pituitary extract or brandy. As these infants are dehydrated, administration of fluid, preferably intraperitoneally, is the most important measure. Using an inverted thermos bottle, with tubing and a glass window regulator, a broad, short-bevelled needle is plunged into the peritoneal cavity 1 inch below and to the left of the umbilicus, and 10 to 13 ounces (300 to 400 c.c.) of hot saline solution run in in the course of 35 minutes. There is no risk of puncturing the intestine. The injection may be repeated in 12 to 24 hours. As a purge, 1 dose of castor oil, 1 fluidram (4 c.c.), is given provided there have been over 5 stools; otherwise no purge is used. A daily rectal wash-out gives comfort, and an electric fan directed 2 feet above the child is of benefit.

Tests performed by A. Ylppö (Zeitschr. f. Kind., June 16, 1924) showed that various adsorbents markedly decrease the acidity of infants' stools in vitro. Clinically, in chronic diarrhea, it is believed that not only the acids but also the bacterial toxins and even the bacteria themselves are adsorbed and gradually inhibited, with consequent recovery from the disorder. The 2 most effective combinations for pediatric use proved to be: (1) Kaolin, 4 parts; tricalcium phosphate, 1 part. (2) Kaolin, 9 parts; animal charcoal, 1 These mixtures were used part. with success, in conjunction with albumin milk, in a number of infants over 1 year of age in whom diet alone had failed. The minimum of adsorbent required is 10 Gm. (21/2 drams), given before breakfast in 50 to 100 c.c.  $(1\frac{2}{3})$  to  $3\frac{1}{3}$  ounces) of water.

## DIGITALIS .- PHYSIOLOGIC

**ACTION.**—According to D. Luten (Ann. of Clin. Med., Sept., 1924), digitalis does not slow the pulse through any direct action in patients with a normal heart rhythm. His patients of this type improved impressively under digitalis, but did not show any slowing until they got better. Patients with an increased pulse rate showed slowing if there was improvement otherwise, but only after the improvement occurred. In adults a reduction of rate should not be an object of digitalis therapy if the rhythm is normal. Digitalis in excessive dosage may produce ventricular acceleration either where there is normal rhythm or where there is auricular fibrillation. When a patient receiving digitalis in adequate amounts exhibits a definite acceleration in ventricular rate, the drug should be stopped.

THERAPEUTICS .- The use of digitalis is justified, according to Robinson ct al. (loc. cit.), when any symptoms are present which can be accounted for by no other cause than myocardial insufficiency. Benefit may follow large oral doses in chronic myocarditis with signs of cardiac failure. The indications are not altered by a lesion of 1 or several heart valves. Repeated clinical observations have disproved the view that pulsus alternans contraindicates digitalis.

According to H. Vaquez (Arch. des mal. du cœur, Oct., 1924), digitalis is very useful in hypertension or interstitial nephritis sufficiently advanced to produce irregular pulse, lowered blood-pressure and edema. E. Bordet and J. Yacoel (Ibid., June, 1924) deem it useful in mitral or aortic valvular disorders as well as in different types of myocarditis, where cardiac irritability is disturbed and the heart-rate somewhat accelerated. In 3 cases in which fluoroscopy showed distention of the heart during attacks of precordial discomfort and cardiac insufficiency, digitalis led to increased distention of the ventricle, whereas 10 to 12 intravenous injections of 0.25 mgm. (1/260 grain) of ouabain brought relief. In marked cardiac dilatation with increased rate and irregular action, digitalis is valuable if preceded by treatment with ouabain, the latter particularly reducing the distention of the organ while the former slows the rate and prolongs the diastolic periods.

## DIPHTHERIA.—DIAGNOSIS.

-In primary tracheobronchial diphtheria, as pointed out by H. Dupuy (New Orl. Med. and Surg. Jour., Sept., 1923), the usual cultures are negative. The most suspicious sign is the gradual onset of persistent and progressive dyspnea. At first the breathing is wheezy; then inspiratory stridor manifests itself, with croupy cough, while the voice remains clear. Air-hunger supervenes, with restlessness. In 1 such case in a trained nurse an early clinical diagnosis was made; laryngoscopy showed membrane protruding from the trachea and recovery occurred under 40,000 units of antitoxin. A similar result was obtained in a child of 18 months.

Brisset (Bull. Soc. nat. de chir., Mar. 29, 1924) describes a staphylococcic pseudodiphtheria, of which he has seen 10 cases. Laryngeal obstruction was always preceded by tonsillitis, sometimes with pseudomembranes. Antitoxin, even when given early, proved useless, and in 4 cases tracheotomy became necessary. The cases responded rapidly to staphylococcus vaccine, however, and no deaths occurred. Infected skin lesions, especially impetigo, in the patient or his associates, should suggest a staphylococcic infection. In doubtful cases of croup not responding to antitoxin, both the latter and staphylococcus vaccine should be given until bacteriologic evidence is obtained. The vaccine also proved beneficial in 4 cases of laryngismus stridulus.

PROPHYLAXIS.—SCHICK TEST AND ACTIVE IMMUNIZATION .-Systematic application of the Schick test and toxin-antitoxin immunization of susceptibles have proven of definite value in the control of diphtheria,

though their use has not as yet been sufficiently widespread to make a definite impression on general diphtheria morbidity. S. B. Hooker (Boston Med. and Surg., Jour., Feb. 21, 1924) emphasizes the efficacy of these procedures in the control of diphtheria among young adults who are later brought into close, prolonged contact with the disease, e.g., nurses and medical students. About 60 per cent. of such individuals were found susceptible to diphtheria. One series of toxin-antitoxin injections immunized 3/4, and a 2d series given to those who had remained Schickpositive was at least equally effective, and resulted in a reduction by over 95 per cent, of clinical diphtheria in the test group.

In regard to children, the consensus of opinion appears to be that all should be actively immunized. of pre-school age, when those Schicked, show a very high percentage of positive reactions, routine Schick testing among this class of subjects has often been dispensed with, and immunization practised as a routine. As is well known, such children are more readily immunized than older children, and show fewer reactions. That diphtheria can be practically, if not wholly, eliminated by this procedure is indicated by the results obtained, as described by F. W. Sears (Amer. Jour. of Pub. Health, Feb., 1924), in a campaign to eliminate diphtheria begun in 1922 in Auburn, N. Y., a city of 36,000 inhabitants. By 1924 the percentage of school children that had given a negative Schick or been immunized had been raised to 85 per cent. There were no cases of diphtheria in this group, 3 cases among the 15 per cent.

of controls, and 3 among children of pre-school age. The prophylactic efforts should be especially concentrated on the kindergarten and pre-school children. Whereas in English-speaking races the writer found a natural immunity of only 18 per cent., among Poles and Italians the percentages were 73 and 64; therefore, Schick testing before giving toxinantitoxin is advisable.

In Massachusetts, B. White (Boston Med. and Surg. Jour., Dec. 20, 1923) found that slightly more than ½ of the school children reacted positively. The percentage of positive reactors (susceptibles) varies inversely with the number of previous contacts with infected individuals.

According to Zingher, the shortest period that should elapse following injection of toxin-antitoxin before retesting for a successful immunity is about 1 year, instead of 6 months, as formerly advocated.

Schick-positive reactors, according to C. C. Okell, A. J. Eagleton and R. A. O'Brien (Lancet, Apr. 19, 1924), do not harbor virulent bacilli unless they are suffering from or incubating diphtheria. Carriers of virulent bacilli are always immune and Schicknegative. For the rapid control of diphtheria outbreaks in institutions, these observers advocate the following measures: (1) Give all patients in the institution the Schick test; (2) swab all patients' nose and throat; (3) next day, isolate in 1 ward all positive Schick reactors; (4) for a few days, see twice daily all positive reactors; (5) test for virulence all positive swabs from negative Schick reactors, and release avirulent but rigidly isolate all virulent carriers; (6) begin at once to inject toxin-antitoxin into all positive reactors.

Certain improvements in respect of the material to be injected for active immunization have been announced of late. A. Zingher (N. Y. State Jour. of Med., Feb. 1, 1924) has described a new toxin-antitoxin mixture containing only a  $\frac{1}{10}$  L + dose of toxin per cubic centimeter instead of the 3 to 5 L + in the old-type mixtures. The toxic or underneutralized fraction of the toxin-antitoxin remains the same as before. Local and constitutional reactions from the new mixture are less, and it can be given to older children and adults without fear of marked local disturbance. Three doses of 1 c.c. each are given at intervals of 7 to 10 days, preferably intramuscularly in the arm.

G. Ramon (Paris méd., Dec. 6, 1924), of the Institut Pasteur, has discovered and introduced a new immunizing material termed anatoxin, based on his observation that mixtures of fresh diphtheria antitoxin and toxin undergo flocculation when mixed in such relative quantities as neutralize each other, and that the power of a toxin to induce immunity is proportionate, not to its actual toxicity, but to its flocculating property. By certain procedures, in particular by adding 3 or 4 parts of formaldehyde solution to 1000 parts of toxin and incubating at 40° C. for 1 month, the toxicity of the toxin can be made almost to disappear, while its flocculant and immunizing properties remain unimpaired. Aside from its low toxicity, anatoxin is advantageous in being stable; it is unaffected by a temperature of 70° C. or by being kept in the ice-box or at room temperature for 1 year. Two injections of 0.5 and 1 c.c., 1 to 2 weeks apart, induced immunity in 90 to 95 per cent. of cases in 5 to 6 weeks, and in 100 per cent, in 2 months. It is believed the immunity will usually persist throughout life. Anatoxin also has possibilities as a therapeutic

agent, in the treatment of carriers, in the prevention of late complications, and in the rapid, intense and safe immunization of horses.

> Park and Zingher (Amer. Jour. Dis. of Childr., Oct., 1924) state that both the new toxin-antitoxin and the toxoid preparations [anatoxin] have given good immunizing results in the cases seen by them, with but slight re-The toxoid contains no horse serum to cause sensitization, but substitution of goat antitoxin for horse antitoxin will likewise obviate this difficulty, and this change is now being made. Such a toxoid would remove the fear in the population created by the recent experience with frozen toxin-antitoxin [freezing setting free the toxin, with resulting severe local and constitutional reactions].

C. Zæller (C. r. Soc. de biol., June 27, 1924) has pointed out that tests with Ramon's anatoxin may be positive in patients in whom the Schick test is negative, and vice versa. Lereboullet, Boulanger-Pilet and Lelong (Bull. Soc. méd. des hôp., Oct. 17, 1924) recognize Zæller's test as a clinically useful one, which should be introduced into current routine practice like the Schick test. The positive response consists of a red papule appearing 24 to 48 hours after an intracutaneous injection of 0.2 c.c. of a 1 per cent. dilution of anatoxin. They agree with Zœller that the positive response shows a special hypersensitiveness to the proteins of the diphtheria bacillus, or diphtheria allergy, with incomplete immunity. In diphtheria the test, negative at first, becomes positive in 5 or 6 days in ordinary cases and much more slowly and less intensely in malignant cases. It reaches a maximum during convalescence and tends to decrease as

complete immunity develops. It is common and especially intense in carriers, is rare in infants, but becomes more common with increasing age. Thus, it does not parallel, but supplements, the Schick test.

TREATMENT.—B. Schick (Boston Med. and Surg. Jour., Mar. 1, 1923) emphasizes that every hour of delay in the injection of diphtheria antitoxin may be harmful. In mild and intermediate cases 100 units per kilo. (2.2 pounds) of body weight suffice; in severe cases 500 units per kilo. should be given. Repeated injections are unnecessary. For passive immunization, 50 units per kilo. suffice. Intravenous injection of antitoxin affords a slight improvement in the curative results, and in dangerous cases may be repeated.

Having selected 125 severe cases for intravenous antitoxin treatment among a total of 1025 cases, D. A. McIntyre and D. W. McKay (Lancet, June 21, 1924) concluded that this method is of great value in such cases. The dosage ranged from 6000 to 40,000 units, the largest single injection being 24,000. In all but 11 cases the initial intravenous dose was followed by intramuscular injections, and the average total amount given was 48,000 units. The mortality rate in these severe cases was 12 per cent., and all but 32 of the 125 escaped paralyses. Toxic symptoms subsided much more rapidly. In all but 24 cases a definite reaction set in about 40 minutes after the injection. Serum sickness developed in 58.

In severe cases K. Kassowitz (Wien. klin. Woch., Mar. 20, 1924) advocates further injections of antitoxin after 1 week, having witnessed relapses of diphtheria between the

10th and 16th days after a single injection. The Schick test was positive in these cases, and the tonsils contained no antitoxin after the 13th day, showing a lack of protection of the tissues, although the blood still contained some antitoxin.

Fifty cases treated with antitoxin intraperitoneally are reported by J. A. Toomey, O. L. Goehle and C. C. Dauer (Amer. Jour. Dis. of Childr., Feb., 1925), who find the method a simple and safe one. The antitoxin is injected without dilution. They deem this the method of choice in severe cases of toxic myocarditis.

To combat diphtheritic intoxication of the *medullary centers* Benhamon, Calmette and Flogny (Paris méd., Apr. 28, 1923) resorted to antitoxin intraspinally in doses of 20 to 40 c.c. in malignant cases, with favorable results. Large doses intramuscularly were given in addition.

In post-diphtheritic asthenia and low blood-pressure, J. Munk (Ned. Maand. v. Gen., July, 1923) finds adrenalin, given subcutaneously, intravenously and by rectum, of value. It is well borne even in large doses. These cases suffer from a vicious circle involving lowered cardiac activity and impaired nutrition of the central and peripheral sympathetic system, which adrenalin overcomes.

## DIPHTHERIA CARRIERS. -

Negative throat cultures were soon obtained in several carriers treated by J. S. Saurman (Jour. Amer. Med. Assoc., July 26, 1924) as follows: On awakening, after each meal, and during the evening, the nares and fauces are flushed with saline solution to remove mucus. They are then at once sprayed with 2 per cent. gentian violet solution. A culture is taken just before 1 of the treatments. When 2 negatives have been obtained, the dye is discontinued and another culture taken 48 hours later.

The patient and family should be warned that the dye will stain everything but the skin, mucosa and teeth.

R. I. Longabaugh (U. S. Naval Med. Bull., Aug., 1924) recommends ether inhalations by the open method every morning for 5 days, sufficient anesthetic being used to produce marked drowsiness.

Data are presented by D. Kahn (Amer. Jour. of Roentg., Oct., 1924) showing that 152 out of 185 carriers treated with the X-ray tended to remain free of virulent organisms after an interval of 90 days. In another series of 23 cases, negative cultures were obtained after 1 or at most 2 treatments. A broad focus Coolidge tube, 10 in. focal skin distance, 7 in. gap, 5 ma., and 3 mm. aluminum filter were used. Both the tonsillar areas and postnasal space were treated at each sitting.

The ultraviolet rays are advocated by H. E. Stewart (*Ibid.*, Dec., 1923). A blunt nasal quartz applicator is used for both the nose and pharynx, and is left in contact 1 minute daily in the nose and up to  $2\frac{1}{2}$  minutes in the throat.

DISLOCATIONS.—HIP.—In regard to congenital dislocation of the hip, Harrenstein (Ned. Tijd. v. Gen., Nov. 8, 1924) points out, after careful anatomic studies, that the conditions in the fetal hip joint as term approaches greatly favor dislocation, the cramped position tending to force out the femoral head. At birth, great care should be taken to allow the child's legs to straighten out spontaneously; forcible straightening at this time stretches the attachments and induces the clinical picture of dislocation.

Lorenz (Ibid., May 26, 1923) has described a new operative technicthe bifurcation method—for irreducible luxation of the hip, congenital or acquired. By a slanting osteotomy of the femur, a new head is carved out on a level with the acetabulum, into which the new head is fitted. The upper end of the femur thus assumes a Y shape, and the leg is slightly shortened. The operation can be carried out without exposing the joint, and is feasible at any age, being available, e.g., to overcome crippling from hip tuberculosis or osteomyelitis and to relieve pain in arthritis deformans. It is also serviceable in pseudarthrosis and in recurring dislocation in coxa vara. In the simpler cases of luxation, however, the writer prefers the inversion method, in which the adductors are stretched or severed, thus transforming the usual adduction into extreme abduction, drawing the ilium downward, affording bony support to the greater trochanter, and throwing the weight of the body partly on the strong anterior portion of the ligamentary apparatus.

A new method of reduction for traumatic dislocation of the hip is described by Dshanelidze (Arch. f. klin, Chir., Aug. 29, 1924). The patient is placed prone, with the thigh hanging over the side of the table, Poupart's ligament running parallel with its edge. The dislocated limb, supported by the surgeon, gradually hangs down from the table, and after waiting 2 minutes, the surgeon flexes the extremity at the knee, rotates it inward, and abducts; he then makes pressure with his own knee in the popliteal space, which he presses downward, meanwhile pressing with his other hand on the lumbar region on the same side and fixing the pelvis. With this procedure no anesthetic nor assistant are required, little effort is expended, and counterextension is automatic. Thirty-six recent backward dislocations were thus reduced.

SHOULDER.—In the reduction of shoulder dislocation J. Malis (*Ibid.*, May 10, 1924) 1st binds the recumbent patient's chest to the table with a towel, then raises the humerus vertically with his right hand, meanwhile manipulating the head of the bone into place with his left thumb on the head in the axillary fossa. Dshanelidze (Ibid., Aug. 29, 1924) has the patient lie on his side, with the arm hanging down from its edge and the head supported by an assistant. After allowing 2 or 3 minutes for the muscles to relax, he flexes the patient's elbow to a right angle, and makes downward pressure on the forearm with both hands, 1st rotating the arm outward and then inward. With a folded cloth under the scapula, the latter is held firm by the edge of the table, and reduction takes place quickly and easily. A little morphine assists in the reduction.

In recurring shoulder dislocation, Oudard (Jour. de chir., Jan., 1924) either introduces a bone graft between the tip and base of the coracoid process, or lengthens the coracoid process by splitting it lengthwise and sliding down the ½ so as to prolong it by 3 centimeters. W. L. Keller (Ann. of Surg., Jan., 1925) recommends crucial capsular plication, transverse and vertical, as promoting uniform contraction of the capsule much better than the old procedure of vertical plication alone.

DIVERTICULITIS OF THE COLON.—According to E. S. Judd and L. W. Pollock (Annals of Surgery, Sept., 1924), diverticulitis may remain unchanged for many years. In many instances it does not cause symptoms. Many cases can be relieved by diet and medical treatment. If an abscess forms from perforation of a diverticulum or from extension of infection through the wall of the colon, drainage is indicated. If perforation occurs in other regions, operation is the only procedure that offers relief. If there is any question as to the nature of the tumor, operation is indicated. The mortality from radical operations has been very high. The best procedure would seem to be a preliminary colostomy to care for any obstruction in the colon, and particularly the reduction of inflammation in the diverticula by frequent irrigations of the lower colon. Resection of the infected portion can then be done with less risk.

DUODENAL ULCER.—DIA-GNOSIS .- Boas (Arch. f. Verdauungsk., Jan., 1923), discussing the differential diagnosis between duodenal ulcer and hyperacidity with gastralgia, states that whereas in ulcer there are emaciation, pallor and weakness, in hyperacidity the general health is little affected. In hyperacidity the gastralgia remains unchanged for years, while in ulcer the intervals of freedom from pain grow shorter and the nocturnal pains more severe. In hyperacidity, withdrawal of the foods exciting marked secretion and substitution of a milk and vegetable diet overcome the pain, while in duodenal ulcer this is much less the case, and rest and a milk

diet are especially required. Even the occurrence of hemorrhages does not preclude the existence of gastralgic hyperacidity.

According to A. F. Hurst and P. J. Briggs (Guy's Hosp. Rep., July, 1924), recent advances in X-ray technic have made it possible to recognize chronic ulcers, large or small, recent or of long standing, with almost absolute certainty in a large percentage of cases. J. S. Diamond (Amer. Jour. of Roentgenol., Apr., 1924), in 30 cases, observed a niche to be the most constant X-ray finding, being present in 20 cases. It may vary from a mucosal defect to a deep crater. A duodenal defect is most often functional, and seldom represents the ulcer base, being usually opposite to it. Giving belladonna for 48 hours, with a milk diet, relaxes spasm and increases the number of visualized niches.

TREATMENT.—Bastedo (Med. Jour. and Rec., Apr. 16, 1924) deems medical treatment successful in the majority of cases. Any focal infection should be removed. The patient is kept quiet in bed for 3 or 4 weeks, next sits in a chair for increasing periods for 1 or 2 weeks, and then walks short distances. For 6 weeks he should lie down after each feeding. His occupation should not be resumed for at least 2 months, and the régime should be followed at least a year. The diet should be restricted, small, frequent meals being given. At first, eggs, milk and cream are best. The milk should preferably be coagulated with rennet or by addition of sodium citrate, 2 grains (0.12 Gm.) to the ounce (30 c.c.). If flatulence, diarrhea, nausea or heaviness result, dried milk should be substituted. If milk sourness occurs (usually due to pyloric obstruction or marked gastric atony), gastric lavage is in order, and the milk should be replaced by cereal with butter, potato, moist toast, soft boiled egg, shredded chicken or scraped boiled beef.

For pain, alkalies may be given during the digestive period or on the empty stomach, but not before meals. Sodium bicarbonate, 1 dram (4 Gm.) in a glass of water, may be given early in the morning, and milk of magnesia, ½ to 1 ounce (15 to 30 Gm.), at bedtime. If the diet fails to control the pain during the day, sodium bicarbonate and light magnesium oxide may be given. Peppermint may be added as carminative. Bismuth subcarbonate is preferable to the subnitrate. Aside from any required laxatives, castor oil or calomel. followed next morning by milk of magnesia, 2 ounces (60 c.c.), should be given once a week. Gastric distention is relieved or cured by heat to the abdomen, sodium bicarbonate and peppermint, lavage, cathartics, or enemas or colon irrigations. Under this régime most patients lose their pain and discomforts in a day or so and are symptom-free during and after the treatment.

DYSENTERY.—AMEBIC.—DIAGNOSIS.—Cytologic diagnosis is stressed by G. R. Callender (Milit. Surg., June, 1925) for the rapid differentiation of the dysenteries, permitting of the application of proper treatment without the delay entailed by bacteriologic methods. With only a microscope and slides, one relatively inexperienced can thus make a presumptive diagnosis which will

be correct in 90 per cent. of cases. Very fresh material is examined unstained in thin film under a cover glass. Thin smears are then made, fixed in Schaudinn's fluid, stained with hematoxylin and eosin, and if entamebæ are found, also with iron hematoxylin. The differential features are tabulated thus:

over the bowels disappears, and the stools are reduced to 1 in 24 to 48 hours; then a normal diet may be gradually resumed. Plain fruit juice, once or twice a day, instead of the milk, is recommended during the acute attack. Emetine hydrochloride is injected in doses of ½ to 3 grains (0.03 to 0.2 Gm.) a day until the

EXUDATE	BACILLARY DYSENTERY	AMEBIC DYSENTERY
Blood. Polymorphoneutrophiles.	Varying amounts. About 90 per cent. of exudate. Many	Small amounts to actual hemorrhage. Few. Cytoplasm of some of those
	show nuclear degeneration (ringing). Cytoplasm frequently contains fat.	present shows degenerative changes and in such the nuclei may ap- pear pyknotic.
Endothelial macrophages.	Present in varying numbers. Actively phagocytic; frequently contain erythrocytes and leucocytes. Undergo toxic degeneration; "ghost cells."	Not seen except in cases also having bacterial dysentery.
Plasma cells.	Present, relatively more abundant early.	Present in small numbers.
Pyknotic bodies.	Proportionately insignificant, but are found.	Constitute about 80 per cent. of cellular elements.
E. histolytica tropho- zoite.	Absent unless the 2 diseases are both present.	Present and must be found to make diagnosis.
Amount of exudate, act- ual hemorrhage ex- cluded.	Massive. A large part of the stool.	Small.
Bacterial content.	Low.	Very high, usually.

TREATMENT.-W. M. James and W. E. Deeks (Proc. Intern. Conf. on Health Probl. in Trop. Amer., 1924) report a reduction of mortality from 6.2 per cent. in 1914 to 1.7 per cent. in 1923 under the combined bismuth subnitrate and emetine treatment. Rest and a generous milk diet are insisted on, and 1 to 3 saline or plain water bowel irrigations are given A heaped teaspoonful, or daily. about 180 grains (12 Gm.), of bismuth, suspended in almost a tumblerful of plain or effervescent water or in milk, is given every 3 hours, night and day in severe cases, the amount being lessened to 4 daily when improvement occurs. In very chronic cases 3 or 4 doses daily are continued for 2 or 3 months. The absolute milk diet is not departed from until the tongue clears, tenderness limit of tolerance is reached. Emetine rarely effects a complete cure if used alone.

C. Garin and P. R. Lépine (Ibid.), in the treatment of amebiasis in France, have found stovarsol and acetylarsan the most desirable arsenical drugs for intravenous injection, being easier to give, less toxic and more effective than neoarsphenamin. Stovarsol is given by mouth in 0.25-Gm. (4-grain) pills, of which 3 are given daily for the 1st and 3d weeks, with an interval in between. Subsequently, 1 pill is taken on alternate days for 1 or 2 months. In combined stovarsol and emetine treatment, 2 pills are given daily in the 1st and 3d weeks and emetine given in the 2d and 4th weeks. Acetylarsan is supplied in 3 c.c. ampoules each containing 0.75 Gm. (12 grains) of the drug. Two intramuscular injections of 1 ampoule are given 3 days apart, then further injections weekly up to 6 or 7 doses. Both of these arsenicals act powerfully also on lamblia.

Bensaude, Cain and Rachet (Bull. Soc. méd des hôp. de Paris, May 15, 1924) deem

intravenous injections of emetine, as recently recommended by Petzetakis, to be justifiable in cases refractory to ordinary methods of treatment with emetine and organic arsenicals, but believe a dosage of 0.02 Gm. (½ grain) a day by this route should not be exceeded, nor 0.25 to 0.3 Gm. (4 to 5 grains) as the total in a course of treatment. Nausea, exhaustion, and later asthenia, multiple neuritis, etc., are apt to follow such injections. Heart-tonics and adrenalin may be given to remedy these effects

BACILLARY.—DIAGNOSIS.—According to A. Guimaraes (Brazilmed., July 12, 1924), macroscopic agglutination is more reliable than microscopic in the recognition of bacillary dysentery and detection of carriers. The test becomes positive by the 7th day, and was positive in 75 per cent. of cases examined early in the course of epidemics, though less frequently later.

R. C. Connor and L. B. Bates (Proc. Intern. Conf. on Health Probl. in Trop. Amer., 1924) warn that a child with high fever, convulsions and diarrhea should be suspected of having bacillary dysentery, especially if the stools contain mucus and are blood-tinged. One negative laboratory report means nothing. A stool specimen should be submitted twice daily for at least 3 days. In the absence of an epidemic, the cases of non-specific enterocolitis so far outnumber the dysentery cases that serum treatment is not necessary until a positive diagnosis has been made.

PROPHYLAXIS.—A. Gauthier (Bull. de l'Acad. de méd., Jan. 15, 1924) reports good results from vaccine prophylaxis by the mouth among Greek refugees. Polyvalent vaccines containing 3 billions of germs per cubic centimeter were used, the doses being 1 c.c. for adults, 0.5 c.c. for children

over 2 years, and 0.25 c.c. below 2 years, repeated on 3 successive days. Agglutinating power already appears on the 3d day. No known infection occurred among 29,880 persons thus vaccinated.

TREATMENT.—According to A. G. Phear (Lancet, Aug. 2, 1924) antidysenteric serum should be given in all but the mild cases. Its value rapidly lessens with delay. Sixty, 80 or 100 c.c. may be injected subcutaneously. Often a single dose suf-In urgent cases of choleraic type the serum should be given intravenously and combined with hypertonic saline solution. Best results are to be expected from a serum containing exclusively Shiga or Flexner antibodies, according to the type of infection, but in practice no time should be lost by waiting for the laboratory report.

Costa Cruz (C. r. Soc. de biol., Oct. 7, 1924) maintains that bacteriophage treatment is now the best method available. It is given by mouth in doses of 2 c.c. (30 minims) twice daily. Improvement results in 4 to 8 hours and convalescence in 24 to 48. As the bacteriophage does not neutralize the toxin, Shiga serum may be needed in addition.

In bacillary dysentery in children, when serum was unavailable, A. Castellani (Proc. Intern. Conf. on Health Probl., 1924) found that the following mixture brought about rapid disappearance of the symptoms:

P. Pulv. rhei comp. 5j-ij (30-60 Gm.)
 Aq. chlorof., q.s
 ad ........... f5ij (60 c.c.).

M. Sig.: Shake and give 1 teaspoonful every 2 hours (to a child of 2 years).

**DYSMENORRHEA**,—Analyzing 100 cases of dysmenorrhea with ref-

erence to the results of treatment, L. Phillips (Proc. Roy. Soc. of Med., Sept., 1923) recognizes 1 large group of cases due to faulty hygiene, upbringing and surroundings. These are thin, anemic subjects, with weak abdominal muscles, absent abdominal breathing, faulty posture, constipated and with visceroptosis or poor circulation. The uterus is often arrested in development and easily exhausted by expulsive work. Other groups are those with general as well as menstrual pain and with headache, nausea and nervousness; those of the obstructive type, and those who complain of pain in 1 iliac region either alone or before the central pain, with signs of arrested development of the genital organs. In nearly all of the 50 cases treated non-surgically with gland extracts, either alone or in combination with antispasmodics, relief was obtained. Ovarian extract, corpus luteum, thyroid, anterior pituitary, or mixed glands were used. Testicular extract, alone or with prostatic extract, is sometimes successful in these cases. General hygienic measures, establishment of a correct mental attitude, correct clothing, relief of constipation, and exercise are other necessary features of the treatment.

In severe essential dysmenorrhea, F. A. Cleland (Amer. Jour. of Obst. and Gyn., Sept., 1924) firmly packs the uterus and cervix with iodoform gauze and leaves it undisturbed until the 8th day. If, as is usually the case, upon using a No. 10 or 11 Hegar dilator an unyielding band is found which precludes further dilatation, he makes, with a blunt-pointed bistoury, 2 lateral incisions in the internal os about 1/16 to 1/12 inch deep. Dilatation is then easily continued to a No. 14 or 15. Asepsis is imperative. Of 175 cases thus dealt with, 138 have been cured or markedly relieved, and in none have any illeffects resulted.

E

EAR, EXTERNAL.—EPITHE-**LIOMA.**—Between seborrheic patches of the auricle and epitheliomas there is no borderline, either pathologically or clinically, according to D. W. Montgomery and G. D. Culver (Arch. of Derm. and Syph., Apr., 1923). Of the writers' 46 cases of epithelioma, most were of the basal-cell type and not very refractory, unless they invaded the external auditory meatus. They may be painful and tender. X-rays or radium is the treatment of choice, especially the latter. Radium may be used for cross-firing. Any remaining cells of low-grade vitality

are best destroyed with trichloracetic acid or acid nitrate of mercury and, if necessary, the curet.

INFLAMMATION.—In inflammation of the external auditory meatus due to persistent otorrhea, furuncle, eczema or foreign body, G. de Parrel (Jour. des prat., Jan. 10, 1925) paints a border of iodine tincture around the lesion and uses the following powder:

R. Bismuthi subsalic.,

Zinc. ox. pulv. ..āā 6 Gm. (3iss);

Cocain. hydrochlor. 0.03 Gm. (gr. ss);

Talci pulv. ...... 30 Gm. (5j).—M.

To prevent crusting, the following lotion is applied:

 R Ichthyolis
 1 Gm. (gr. xv);

 Resorcinolis
 0.75 Gm. (gr. xij);

 Balsam. Peruv.
 5 Gm. (mlxxv);

 Ol. ricini
 60 Gm. (f3ij).—M.

When the discharge has dried up and little crusting remains, 4 per cent. silver nitrate solution may be applied every 3 days.

ECTOPIC GESTATION.— DIAGNOSIS.-In doubtful cases, if the patient can be kept under observation for a few days, Tkadlecek (Casop. lek. cesk., Dec. 13, 1924) advocates milk injections. In the presence of ectopic gestation the tumor will not change in size or increase, whereas an inflammatory adnexal mass will become smaller. Z. Bánki (Zent. f. Gyn., Jan. 17, 1925) states that in early extra-uterine pregnancy sharp pain is felt if 1 or 2 fingers are inserted in the posterior fornix and the portio or whole uterus is pushed toward the symphysis pubis. Presence of this induced pain is evidence against criminal abortion or appendicitis.

TREATMENT.—According to T. S. Welton (Amer. Jour. of Obst. and Gyn., Feb., 1924), the systolic pressure is a good index of the patient's condition. If the woman with ruptured ectopic pregnancy does not die almost immediately, she is in a state of shock which is often amenable to treatment, thus making surgery safer. Shock with a pressure of 90 or above is often due to injury and not the hemorrhage. If, however, the systolic pressure continues to fall in spite of treatment, surgery is imperative. A pressure that rises and then remains stationary calls for surgery after a time which varies with the type of case and the operator's experience.

A pressure that rises and then begins to fall calls for surgery immediately. [See also Abortion, Tubal.]

ECZEMA.—Observing that nervous disturbances are an important factor in the causation of eczema, A. J. Lebedjew (Derm. Woch., Aug. 30, 1924) injected 10 c.c. (2½ fluidrams) of 10 per cent. sodium bromide solution in saline solution intravenously, daily or on alternate days, in 55 cases, with good results. Acute eczema responds rapidly, and the procedure is also of great service in chronic eczema, urticaria, lichen planus and acute psoriasis. C. Wolff (Ibid., Jan. 24, 1925) confirmed Lebedjew's results in 10 cases of eczema and other itching dermatoses, including chronic senile pruritus.

Schamberg and H. Brown (Arch. of Derm. and Syph., Dec., 1923) found the blood uric acid above the maximum normal figure in 44 per cent. of a large series of eczema patients, and by means of a diet calculated to oppose this condition cured a number of previously refractory cases.

According to Lampronti (Rif. med., Feb. 26, 1923), application of a 6 per cent. calcium chloride ointment is often effective after failure of all other measures, causing many of the crusts to drop off in 24 or 48 hours and the skin soon to resume its normal appearance. Grueter (Zent. f. Chir., June 16, 1923) found animal charcoal effective in a case of abdominal eczema due to a fistula of the small intestine.

Crude coal tar has been found very effective by C. J. White (Ther. and Diet. Age, Feb., 1925) in both infantile eczema and that of adults.

His formula calls for crude coal tar and zinc oxide, of each 1 part, and vaselin, 16 parts. The tar and zinc are combined slowly and very thoroughly before admixture with the vaselin. The ointment is applied twice daily; each time, the remains of the previous application must be wiped away thoroughly with sterile gauze soaked in olive oil. No bandage, soap or water is used. The areas treated must be kept out of the sun and must not be too large, because of the possibility of toxic absorption. The drug should not be used where there is actual pus or vesiculation.

INFANTILE ECZEMA.—Marfan (Nourrisson, Sept., 1923) considers the main cause to be overfeeding with milk of excessively high fat content. Aside from this indication, the treatment consists of local measures for removal of the crusts, thyroid gland, subcutaneous milk injections, and high altitudes—3000 to 4500 feet. Gartje (Mon. f. Kind., Apr., 1923) similarly recommends a fat-free diet for patients with dry eczema who are not stout. P. Rueda (Sem. méd., Nov. 20, 1924) assists the pancreas in its task of coping with the fat in the milk by feeding pancreas tissue in tablets or powder form in a dosage of 0.5 to 3 Gm.  $(7\frac{1}{2}$  to 45 grains) daily. Complete cure results in 1 to 4 weeks.

Calcium chloride subcutaneously or intravenously in doses of 1 to 3 c.c. (16 to 48 minims) of a 5 per cent. solution is recommended by Flamini (Pediatr., Nov. 15, 1923).

**EMPYEMA.**—Aspiration and injection of an aqueous solution of gentian violet were practised by R.

C. Davis (Amer. Jour. Med. Sci., Nov., 1923) in 18 cases of empyema, who advocates this method in all acute empyemas and all empyemas in which the fluid is seropurulent. In 3 cases in which the exudate was already organized, small amounts of 0.25 to 1 per cent. chlorazene solutions were injected to dissolve the exudate. By the gentian violet method, a certain number of cases will clear up without further treatment; if not, the patient is in a better condition for surgical drainage at the proper time.

W. D. Gatch (Ind. State Med. Assoc. Jour., Sept., 1924) succeeded in closing 21 cases of chronic empyema by injection of 2 to 5 per cent. chlorazene solutions. The patient is placed on his sound side and the cavity filled with the solution through a funnel inserted into the drainage tube. This position is maintained for 15 or 20 minutes and the solution then drawn off by aspiration. The treatment is repeated 3 or 4 times a day. In cases without tuberculosis or bronchial fistula, results were quickly and easily obtained.

According to H. S. Penn (Boston Med. and Surg. Jour., Oct. 25, 1923), normal horse serum is the ideal agent for irrigations in both acute and chronic empyema. Vallet and Augé (Bull. de l'Acad. de méd., July 29, 1924) report good results from an autogenous vaccine in 6 cases.

ENCEPHALITIS, EPIDEMIC.—SYMPTOMS.—F. X. Dercum (N. Y. Med. Jour., Oct. 3, 1923) regards dimness of vision as of great importance; it may exist when both diplopia and ptosis are absent or slight, and is due to paresis of accom-

modation and frequently also of convergence. The light reflex is usually intact, giving rise to a reversed Argyll-Robertson pupil.

W. Boyd (Quart. Jour. of Med., Jan., 1925) comments on the striking difference in the symptoms observed in 2 epidemics in Winnipeg. Whereas in the 1st the patient would lie like a log in bed, with drooping lids or closed eyes, in the 2d the body and mind were keyed to such activity that ordinary sedatives were of no avail. The patient would attempt to leap out of bed, and uttered a torrent of words, rational at 1st, then drifting into an occupational delirium. The author himself experienced, in particular, a peculiar hyperesthesia of the scalp and upper part of the face.

Abdominal myoclonus was noted by A. J. Hall (Lancet, Mar. 29, 1924) as a prominent symptom in an epidemic. E. Trömner (Deut. med. Woch., Jan. 16, 1925) refers to the increasing multitude of symptoms recorded. He witnessed, among others, a scarlatinoid rash, desquamation from the hands and forearms, a myxedematoid condition of the hands, xanthochromia, hemiatrophy of the tongue, and attacks of hemispasm and hemiataxia.

ETIOLOGY.—According to Levaditi (Paris méd., Jan. 31, 1925), the saliva virus, that of herpes and that of encephalitis are variants of the same filtrable virus. Encephalitis develops when its virulence for some reason becomes enhanced and it passes through an inflamed nasopharyngeal mucosa to invade the central nervous system.

E. C. Rosenow (Jour. of Inf. Dis., Apr., 1924) reports having isolated somewhat peculiar streptococci constantly from infected tonsils, teeth or nasopharynx during life in 81 cases, and from the brain after death. After as many as 44 subcultures and a series of animal passages, characteristic symptoms and lesions of different forms of encephalitis were reproduced in animals.

TREATMENT.—While no dependable treatment for epidemic encephalitis can be said to have been discovered, numerous reports of apparently favorable results from a variety of procedures are continually being made. Carnot and Blamoutier (Paris méd., Feb. 24, 1923) were impressed in 2 cases with the effects of daily intravenous injections of sodium salicylate. Courcoux and Meignant (Bull. Soc. méd. des hôp. de Paris, May 8, 1924) noted rapid improvement in a patient given 6 daily intravenous injections of 4 Gm. (1 dram) of the salicylate in a 4 per cent. solution, and subsequently, the same amount intramuscularly. Daily intravenous injections of 20 to 60 Gm. (5 to 15 drams) of acriflavin are advocated by Buss and Peltzer (Deut. med. Woch., July 25, 1924). Others have used smaller doses, such as 5 c.c. (80 minims) of a 0.5 per cent. solution.

Agostini (Policlin., July 21, 1924) injects 0.15 to 0.5 Gm. of neoarsphenamin at weekly intervals. Visher (Northw. Med., June, 1924) advocates intravenous injection of 10 c.c. of 1 per cent. mercurochrome in freshly distilled water. E. Matthew (Lancet, June 7, 1924) injects 4 c.c. of 25 per cent. magnesium sulphate intramuscularly at intervals of 12 and later 24 hours, arresting the myoclonic and choreo-athetotic movements.

C. E. Riggs (Minnesota Medicine, Oct., 1923) favors lumbar puncture and sodium iodide intravenously. J. H. Leiner (N. Y. State Jour. of Med., Dec., 1923)

urges persistent non-specific therapy by injections of sodium nucleinate.

Neustaedter, Hala and Banzhaf (*Ibid.*, Jan., 1924) gave intravenous injections of 20 to 30 c.c. of immune antipoliomyelitis horse serum in a series of serious cases, with recovery of 23 out of 30 cases. F. Stern (Med. Klin., July 27) injected 50 to 80 c.c. or more of convalescents' serum intramuscularly; of 27 acute or subacute cases, but 1 died. R. W. Power (Brit. Med. Jour., June 28, 1924) witnessed relief from pain and spasms following 2 injections of 10 c.c. of the patient's spinal fluid intravenously, 24 hours apart.

In the postencephalitic Parkinsonian syndrome, many authors laud scopolamine hydrobromide in doses of ½00 up to ½00 grain (0.00015 to 0.0012 Gm.) 4 times a day. For patients sleepless by night but sleepy by day, Norgate (Lancet, Oct. 11, 1924) reports good results from keeping a bright light in the room at night, with a blue shade, and tiring outdoor exercise in the daytime.

ENDOCARDITIS. — A state of subacute bacterial endocarditis of the Streptococcus viridans type was observed in 17 patients by L. H. Behrens (Ann. of Clin. Med., Sept., 1924). In a heart case with irregular, remittent fever, loss of weight, joint pains, myalgia, progressive anemia of secondary type, anorexia, moderate leukocytosis, and the characteristics of a mild or moderate septicemia, persistent blood cultures should be made, and the organism will be found in 90 per cent. The majority of his cases began with a throat infection. Anhemolytic streptococci were isolated in 9 out of 11 cases recorded by W. L. Bierring (Wis. Med. Jour., Nov., 1923). One case recovered following large doses of sodium cacodylate intravenously. The basal metabolic rate was found considerably increased by H. Gessler (Arch. f. klin. Med., June, 1924) in some cases of endocarditis lenta, in spite of the days or even weeks of normal temperature interrupting the usually slightly febrile course.

TREATMENT.—Little that is impressive has appeared of late in this connection. J. A. Bargen (Arch. of Int. Med., Nov., 1923) observed distinct benefit from sodium cacodylate in rabbits inoculated with S. viridans cultures from patients with infectious endocarditis [affording support to Capp's method of giving patients 1 to 4 grains (0.065 to 0.26 Gm.) of this drug daily over a long period]. Fontanel, Devic and P. Durand (Lyon méd., Jan. 20, 1924) report a case of subacute infectious endocarditis, confirmed by blood culture, in which series of daily injections of an autogenous vaccine seemed to benefit, the patient living nearly 2 years. E. Wordley (Lancet, Aug. 2, 1924) reports a case of joint pains and severe endocarditis in which 3 immunotransfusions were followed by marked improvement, the patient returning to his work.

C. A. Ray (South. Med. Jour., Oct., 1924) states that in endocarditis complicating acute infections there should usually be no hesitation in resorting to surgical measures for the removal of foci of infection during the cardiac inflammation.

**ENDOCRINS.** See the various individual glands.

ENTEROPTOSIS, See VISCERO-PTOSIS.

EPIDIDYMITIS.—According to A. A. Wren and J. L. Tenenbaum (Surg., Gyn. and Obst., Oct., 1924), turpentine injections deserve a prom-

inent place in the treatment of epididymitis. A 20 per cent. emulsion of it in olive oil is injected upon the pelvic bone fascia on alternate days in doses of 0.5 to 1 c.c. The injections per case averaged 3 to 4. B. C. Corbus and V. J. O'Conor (Jour. of Urol., Aug., 1924) regard diathermy as specific in gonorrheal epididymitis.

EPILEPSY.—In protein hypersensitivity tests carried out in 122 epileptics by R. L. Wallis, W. D. Nicol and M. Craig (Lancet, Apr. 14, 1923), involving the proteins of egg, meat and fish, milk of various animals, vegetables and cereals, 46 gave positive reactions to various proteins. In some cases in which it was possible to adjust the diet on the basis of the skin tests, no further treatment was necessary. Peptone was given orally to 24 patients, some of whom were benefited. E. B. McCready and H. M. Ray (Med. Jour. and Rec., Oct. 15, 1924) point to the frequency with which the anamnesis reveals that the onset of convulsions followed and was attributed to the ingestion of some particular food, such as eggs, pork, cabbage, or bananas, which had before not been used or, if so, had not agreed with the patient.

In 13 cases, mostly severe, Schou and Teglbjærg (Hospitalstid., Jan. 22, 1925) found that 2 to 6 days of fasting resulted in temporary suspension of the seizures and mental improvement, in several instances persisting for some time.

In all of 27 cases studied by A. W. Robertson (Brit. Med. Jour., Dec. 27, 1924), the clinical and laboratory evidence was eloquent of *chronic intestinal stasis* and intestinal catarrh.

A ketogenic diet is recommended by M. G. Peterman (Amer. Jour. Dis. of Childr., July, 1924). Of 17 cases, 10 were entirely freed from convulsions and 4 markedly improved. The diet consists of feeding only 10 to 15 Gm. of carbohydrate a day, with not over 1 Gm. of protein per kilo. of weight, and enough fat to make up the required calories. The best results were obtained in petit mal.

Phenobarbital (luminal) proves effective, according to I. A. Darling (Arch. of Neurol. and Psych., Apr., 1923), in idiopathic and traumatic epilepsy, but is of doubtful value in senile and syphilitic epilepsy. This drug and bromides may be combined and better results thus obtained in selected cases. Phenobarbital has a cumulative effect, which is corrected by a break of 2 days in each week. If the drug is suddenly broken off, the risk of a resulting series of seizures is much reduced by giving bromides at once. A safe dosage is 11/2 grains (0.09 Gm.), given 5 days a week. Possible ill-effects, especially from larger doses, are a morbilliform or scarlatinoid rash, symptoms simulating alcoholic intoxication, severe diarrhea, mental hebetude, and delirium. J. Collier (Lancet, Aug. 23, 1924) prefers giving not over 11/2 grains of phenobarbital in the morning in diurnal epilepsy, not over 25 grains of bromide at night in nocturnal epilepsy, and both remedies when attacks occur both day and night. S. II. Hall (Ibid., Aug. 16, 1924) used dialacetin in 52 cases, and found all but 1 patient cheery and optimistic under it. Each tablet contains 1½ grains of dial and 4 grains of allyl-para-acetaminophenol. The dose is 1/2 tablet twice daily, increased

up to the maximum tolerated. The best results were in cyclic cases.

In a case of status epilepticus, T. G. Hall (Ill. Instit. Quart., June, 1924) witnessed gradual cessation of convulsions under potassium iodide, 20 grains (1.25 Gm.) 3 times daily.

According to R. H. Spangler (Atlantic Med. Jour., Dec., 1924), a certain proportion of the cases may be regarded as endocrin epilepsy. He favors non-specific protein injections in the form of venom protein (crotalin) for activation of the endocrins. Gland substances are also given by mouth. M. Kern (Hosp. Soc. Serv., May, 1924) reports gratifying results in 4 out of 5 cases from combined thyroid, pituitary, ovarian G. C. Bolten testicular extracts. (Ned. Maand. v. Gen., xii, 637, 1924) reports a number of cases notably improved by thyroid gland. Bisgaard (Acta med. scand., Jan. 1, 1925) maintains that parathyroid extract is useful, restoring the ammonia values.

Several cases of epilepsy connected with menstruation were successfully treated with the **X-rays** by M. Fraenkel (Zent. f. Gyn., Sept. 13, 1924).

In children with seizures related to sleep or fatigue, P. Karger (Deut. med. Woch., Nov. 7, 1924) endorses Stargardter's method of giving 10 to 15 drops of a 20 per cent. solution of caffeine sodio-benzoate once to 3 times daily for 2 or 3 months.

ERYSIPELAS.—Injection of cow's milk, usually in doses of 3 to 5 c.c. (48 to 80 minims), is regarded by Lebbetter (Can. Med. Assoc. Jour., Dec., 1924) as a rapid, positive and economical factor in the cure of erysipelas. The milk is heated on a boiling water bath for 10 minutes, shaken well and given either subcutaneously or intramuscularly. If

required, the dose may be repeated on 4 or 5 consecutive days.

Convalescent erysipelas serum from patients with normal temperature at least 1 week was used by H. P. B. Jordan and C. C. Dustin (Jour. Amer. Med. Assoc., Mar. 15, 1924) in 18 cases in an average dose of 15 to 20 c.c. intramuscularly, with remarkable improvement in 13 cases.

ETHYLENE.—Ethylene is now universally recognized as a valuable addition to the list of available anesthetics. Over nitrous oxide it presents the advantage of permitting admixture of a percentage of oxygen much more closely approximating that of atmospheric air without loss of the anesthetic effect, thus largely eliminating anoxemia and cyanosis from the anesthetic state. According to J. S. Lundy (Jour. Amer. Med. Assoc., Aug. 2, 1924) poor risk patients relax satisfactorily, as a rule, with a mixture of 75 per cent. ethylene and 25 per cent oxygen, and in them the optimal result is obtained.

Among the many recent favorable reports on the use of ethylene, a typical one is that of J. R. Aurelius (Minn. Med., Aug., 1924), relating to 300 cases, of which 194 were major surgical procedures. The age limits ranged from 2 months to 77 years, and for both extremes ethylene seemed an ideal anesthetic by reason of the ease and rapidity of induction, the quiet, undisturbed respiration, regular pulse, and absence of postoperative shock, lung involvement or severe vomiting. The average duration of anesthesia was 43 minutes, with 7 cases consuming over 2 hours. In 40 cases ether was used at some time, either to aid relaxation or during induction in excitable subjects. In most cases relaxation was very satisfactory, being definitely more complete than with nitrous oxide. General convalescence was rapid and uneventful, and gas pains caused little complaint. The gas is considerably less costly than nitrous oxide. It entails very little risk in pulmonary conditions.

### EXOPHTHALMIC GOITER.—

See Goiter, Toxic.

#### FATIGUE INTOXICATION.

-According to E. H. Ochsner (Ill. Med. Jour., Feb., 1923), chronic fatigue intoxication is a distinct disease entity. In nearly all of the severe cases the patients suffer much from hyperchlorhydria, eructations and constipation. Proper diet, rest and symptomatic treatment, while sometimes helpful, never yield a cure. Among the required measures to promote elimination of accumulated fatigue material, good air, both day and night, is essential, and suitable baths are valuable adjuncts. In extreme cases, castor oil, 1 ounce (30 c.c.) every evening on retiring or the 1st thing in the morning, is indispensable. Carefully supervised massage is indicated. Only when the patient is relieved of all his symptoms should gradually increased physical exercise and physical reëducation of the atrophied muscles be instituted. Exhaustion must be guarded against throughout, lest a relapse occur.

**FRACTURES.**—N. D. Royle (Med. Jour. of Austral., Aug. 9, 1924) refers to the tendency to redisplacement which exists in the drying of plaster casts as ordinarily applied. To secure better results, he advocates a **3-plaster method**. The joints above and below the fracture are 1st encased, and the plaster allowed to set. Reduction of the fracture by manipulation or traction is next effected, and the middle section then plastered.

Direct leverage is lauded by J. E. M. Thomson (Surg., Gyn. and Obst., Sept., 1924) for reduction of fractures after a reasonable effort at manual manipulation has failed. The type of

lever used is a dental probe with rounded end or, if a heavier lever is needed, a ¼-inch round steel rod 8 to 12 inches long. For insertion of the lever a small stab is made with a scalpel at the most suitable point for leverage, and the lever then passed between the ends of the fragments.

Reduction having been obtained, a cast is applied, anchoring the lever in the position which maintains the fragments. Where fluoroscopy is unavailable, traction is 1st made, and then a small incision for insertion of the lever and the index finger to the bone fragments.

FEMUR.—Neck.—According to M. S. Henderson (Minn. Med., Dec., 1924), Whitman's abduction method has a sound basis. The teaching that non-union is to be expected in these cases is now in the discard. Careful checking-up by measurements and X-ray examinations at the time of injury will prevent many mistakes. Clinical reëxamination at frequent intervals, if Roentgenograms are not made, will reveal the cases in which the impaction breaks down. In case of non-union, the bone pegging operation, preferably using the fibula, is best.

In ununited neck fractures, O. Hildebrand (Zent. f. Chir., Jan. 19, 1924) removes the head of the femur and deepens the groove between the greater trochanter and neck by removal of a wedge-shaped piece of bone. The stump of the neck is thus lengthened to fit into the acetabulum and the upper acetabular margin fits into the artificial groove, thereby affording a secure joint which more

than compensates for the slight shortening.

Shaft.—In patients between 7 and 14 years of age, immediate immobilization in plaster gives good results, according to Firor (Johns Hopk. Hosp. Bull., Dec., 1924), while in children below 7 it gives results as good as those from overhead traction.

In a case of fracture at the lower third in which calipers to the condyles and the double inclined plane failed to improve deformity in a week, W. H. Byford (Jour. of Bone and Joint Surg., Apr., 1924) removed the splint and changed the extension so that the thigh was held perpendicularly to the bed, with the leg hanging down in acute flexion, with the result that reduction was accomplished in 3 days.

**RADIUS.**—For the reduction of typical Colles's fracture or an overlapping fracture higher up, T. T. Thomas (Intern. Clin., iv, Ser. 33, 179, 1923) counsels the following: Make powerful traction and countertraction longitudinally to overcome all shortening; then strong ulnar flexion to overcome all radial shortening and displacement of the lower fragment; then strong palmar flexion to correct the posterior displacement, the thumb of the surgeon's proximal hand pushing the lower fragment forward, and the fingers, the upper fragment backward. A light plaster cast of the hand and forearm is then applied, holding the hand in forced palmar and ulnar flexion to maintain the reduction. The posterior 1/2 of the cast can be removed in 4 days to 1 week, and massage started at once, and a little later passive motion. However slight the displacement, ether should be used in the reduction, whether impaction be suspected or not, since even mild persisting displacement can

cause prolonged or permanent disability.

TIBIA.—Two cases of sprain-fracture of the tubercle of the tibia sustained by boys of 14 and 16 years while playing football are reported by T. F. Mullen (Northw. Med., Sept., 1924). In 1 case the knee was strapped with a basket-strap of adhesive plaster and a light cast applied, renewed weekly for 3 months. In the other case both knees were strapped, and the strapping changed every few days for 5 months. Entirely satisfactory results were thus obtained in both cases. Neglected cases in adults may require operation.

FURUNCULOSIS.—In patients with this condition, I. B. Bartle (Med. Jour. and Rec., Sept. 3, 1924) frequently finds an excessive blood sugar, from 130 to 260 mgm. per 100 c.c., even though no glycosuria is present. The same condition often exists in severe injuries with slow healing or non-union of bone. Good results follow reduction of the diet to as near a 1500-calorie diabetic diet as possible, together with insulin, 1 unit daily before the noon meal for every 15 mgm. of blood sugar excess, where the blood sugar exceeds 130 mgm. per 100 c.c.

Autohemotherapy is strongly recommended by J. Nicolas, J. Gaté and D. Dupasquier (Lyon chir., Sept.-Oct., 1923). The blood is drawn from a vein and reinjected at once subcutaneously or into the gluteal muscles. The dose is generally 10 c.c. for adults and 2 c.c. for children, repeated every 2d or 3d day, up to 15 or 20 injections, to prevent recurrence.

GALL-BLADDER.-E. L. Mason (Med. Insur., combining Pract. Med. and Surg., Feb., 1924) summarizes as follows the present status of our knowledge of infection of the bile tracts, its sequelæ, and the resultant pathology: (1) Most gastric symptoms are extra-gastric in origin, and infections in the bile tracts and the vermiform appendix are the chief exciters of such symptoms. fections of the bile-tracts occur chiefly through the connections between the lymphatics of the liver and the deeper layers of the gall-bladder and ducts (Graham and Peterman). Hence, we may look for the etiology chiefly in the pathology of the regions draining into the liver from the appendix, colon, rectum, first inch of the duodenum, stomach, etc. Rosenow showed the primary focal infections in the apical abscess, diseased tonsils, diseased sinuses, and the selective affinity of certain organisms for the bile tracts. (3) Infection in the bile tracts (gall-bladder and ducts) is the essential cause of trouble, and not the gallstones, which may or may not be present. (4) The severer types of infection are less liable to be accompanied by stone formation than the mild. (5) The gallstone is often the end-result of years of infection. (6) The carefully secured clinical history will apply to all cases.

BILIARY COLIC.—In a series of 74 cases of biliary colic seen by Finkenheim (Zentralbl. f. Chir., July 26, 1924), no gall-stones were discovered at operation but, instead, inflammatory changes in the gall-bladder or vicinity. Six patients died.

Hepatic colic, according to Parturier (Presse méd., Oct. 29, 1924), is a reaction of the gall-bladder, rich in lipoids, and especially in cholesterol, to a general protein poisoning. Or, some toxic may cause irritation of the gall-bladder as it is eliminated with the bile. The conditions producing the colic are thus similar to those preceding an attack of gout.

STRICTURE OF THE BILE DUCT.—Intubation for stricture of the common bile duct was resorted to by Cope (Lancet, Dec. 6, 1924). He dilated the strictured portion of the cystic duct by means of a Lister's bougie, and then intubated the stricture with a rubber drainage tube left in the duct. For 14 days after operation the bile continued to come away through the abdominal wound. The latter then healed and the stools regained their normal color. The patient left the hospital looking and feeling well.

Judd and Burden (Ann. of Surg., Aug., 1924) observed 10 cases of postoperative stricture of the common bile duct. It is usually the result of operative trauma, but may also follow localized infection or necrosis of the wall of the duct. The symptoms are those of intermittent biliary obstruction, and often suggest stone in the common duct. The patients are very ill and are grave surgical risks because of jaundice, cholangitis and impaired liver function. The site of the stricture is usually at the juncture of the cystic and common ducts. Operation should provide biliary drainage and restoration of the normal course of the bile. Results of operation are fairly satisfactory, considering the hazard and technical difficulty.

GALL-BLADDER SURGERY.— W. Martin (Ann. of Surg., Mar., 1924) could find no reports of serious interference with function or loss of nutrition following the removal of the gall-bladder, although thousands have been removed during the last 40 years. That the gall-bladder should be removed for very slight lesions of the wall, accompanied by symptoms of indigestion, however, is not established. Slight degrees of cholecystitis may resolve. The prophylactic removal of a normal gallbladder does not seem justified. Nor do the majority of infections of the wall of the gall-bladder, sufficient to give symptoms, represent a direct extension to its walls from an inflamed liver through the lymphatics. Necropsy records and clinical experience furnish abundant evidence of the very slow progression of lesions in the gall-bladder. Its removal for gall-stones and well marked lesions of its wall, uncomplicated by lesions of the common duct, gives a low mortality and excellent results.

According to Judd (Minn. Med., Mar., 1924), the results of operations for inflammatory conditions in the biliary tract are, as a rule, gratifying. The gall-bladder may be removed, stones taken from the common duct and the biliary tract drained, and the patient return to a normal state of health in a short time, with slight prospect of ever having further trouble.

In a report of 85 cases of surgery of the bile duct, E. Friend (Ill. Med. Jour., June, 1924) had a mortality of 5.88 per cent. Gall-bladder disease

is more common in women, occurring more frequently during the 4th and 5th decades of life. A carefully taken history and accurate physical examination will lead to earlier treatment at a time when the risk is comparatively small. Early diagnosis and immediate operation are essential to a successful outcome. It is only in this way that the mortality rate both from cholecystotomy and cholecystectomy will be reduced.

TUMORS.—Benign tumors of the gall-bladder, papilloma and adenoma especially, are not so rare as formerly, according to I. Abell (Ann. of Surg., Mar., 1923). In the Mayo series they occurred once in every 23 cases of cholecystectomy and once in every 36 cases of the writer's The invariable presence of chronic inflammatory changes in gallbladders containing such tumors emphasizes the importance of chronic irritation as an etiologic factor. Such tumors occur in the course of chronic cholecystitis and afford an additional argument in favor of cholecystectomy.

[See also BILE-DUCTS, CHOLECYSTITIS and CHOLELITHIASIS.]

### GALL-TRACT, NON-SURG-ICAL DRAINAGE OF. —C. D.

Aaron (Therap. Gaz., Nov., 1924) recalls the value of duodenal lavage with saline cathartics in the treatment of chronic intestinal stasis and accompanying disorders, removal of which is fully assured by this method. It has not only been generally adopted, but its results have been incidentally serviceable in previously unexpected directions. There has not been a single failure in any of the writer's cases of intestinal stasis, and incidentally also of constipation, although the kinks and adhesions remained unchanged. This indicates that kinks and bands, which have been pronounced physio-

logic by some authors, are not necessarily the cause of intestinal stasis, and that, consequently, their surgical removal will not cure the stasis. Another conclusion is that any other pathologic condition, such as rheumatoid arthritis, gout, functional heart disorders, arteriosclerosis, epilepsy, asthma, cirrhosis of the liver, primary and secondary anemia, skin diseases, catarrhal inflammation of the mucous membranes, eye diseases, neuralgia, neuritis, insomnia, neurasthenia, melancholia, dementia, and insanity, should disappear after successful duodenal lavage if they are really caused by intestinal stasis. If they fail to do so after the supposed causative factor has been removed, it follows that the etiology requires correction, and that these conditions were not after all due to intestinal stasis.

With this procedure it is possible for the clearing of the bowel, even in the presence of stasis associated with obstipation, to assist in the recovery of many such cases without surgical intervention.

While the Lyon method is a great aid in diagnosis, it has not led us far in therapeusis. In fact, biliary drainage, achieved with much care and discrimination, does not dispose of the fact that magnesium sulphate is a cathartic, and that this drug is not completely withdrawn through the duodenal tube. It is possible that the clinical results reported are due to the cathartic action of the magnesium sulphate, as Lyon has conceded.

According to Piersol and Bockus (Amer. Jour. Med. Sci., Apr., 1923), the biliary drainage method of Lyon, based on the hypothesis of Meltzer, is useful and practical. The bile obtained is doubtless derived from the common bile duct, the gallbladder, the hepatic duct and the biliary capillaries, in the order given. Diseases of the gall-bladder and of the bile ducts can thus be recognized by a microscope and bacteriologic study of the bile, which under pathologic conditions shows significant alterations. However, the information obtained by non-surgical biliary drainage is only a diagnostic adjunct, and in no sense should take the place of a careful history and complete physical examination.

Friedenwald, Martindale and Kearney (Jour. of Metab. Research, Sept., 1922)

conducted animal experiments with the Lyon-Meltzer method to estimate quantitatively the flow of bile and duodenal contents from a given sector of the duodenum when stimulated by magnesium sulphate. An anterior gastro-enterostomy was performed on a large dog. A small rubber tube was inserted into the duodenum directly opposite the ampulla of Vater. The intestine was then tied off on each side as close as possible to the tube, leaving a closed pouch on the intestine, about 21/2 inches long. The duodenal contents were then collected at hourly intervals. It was found that magnesium sulphate quantitatively increases the flow of bile when applied locally to the duodenal mucous membrane near the gall-bladder opening. The bile flow is produced not by a central action, but definitely by a local mechanism.

In animal experiments, A. Sachs, M. C. Howard and M. W. Barry (Amer. Jour. Med. Sci., Mar., 1924) determined that the gall-bladder contracts, though slightly. The gall-bladder and the common duct sphincter are probably regulated by a definite reflex mechanism, but more proof is needed before this can be accepted as true. Gallbladder contraction alone does not empty the gall-bladder. While a reservoir, it has definite functions, even though these functions are not essential to life. Biliary drainage is of some value diagnostically, but is of no value in differentiating cholecystitis from cholelithiasis. It is of more value as a therapeutic adjunct than as a diagnostic agent. It is curative in mild cases; however, it is to be used more as a palliative measure than a curative agent.

E. Hollander (Amer. Jour. Med. Sci., Apr., 1923) asserts that in many cases the definite diagnosis of gall-bladder disease cannot be made by any other method. Such disease being a frequent cause of intraabdominal symptoms (second only to disease of the appendix), this test should be included as a routine in the study of gastro-intestinal cases.

With the gall-bladder visualized by the Graham method, D. N. Silverman and D. J. Menville (Jour. Amer. Med. Assoc., Feb. 7, 1925) observed in 2 cases that following a single stimulation with magnesium sulphate solution the roentgenograms showed a reduction in size and alteration in shape of

the gall-bladder shadow. From this one is led to conclude that in "non-surgical biliary drainage" drainage of the gall-bladder actually does take place.

In the experience of M. L. Wilbanks (Tex. State Jour. of Med., Mar., 1924), when there is present inspissated mucus or tarry bile, recovery of bile may be impossible, especially during the first drainage attempted. In general, however, failure to obtain gall-bladder bile after stimulation with magnesium sulphate indicates complete obstruction of the cystic duct, due either to stones, adhesions or pressure from without by a tumor. A dark, turbid bile with many microorganisms, much mucus and pus, and an increase in the cellular elements, points to an infected gall-bladder. While non-surgical drainage cannot cure cholelithiasis, it is of undoubted value in overcoming infection following operations and in overcoming biliary stasis, improved digestion resulting.

After a study of 274 cases, C. M. Jones (Arch. of Int. Med., July, 1924) emphasizes high-speed centrifugalization of the duodenal contents as the only means of securing consistent sediment findings. Abnormal findings consisted of bile-stained epithelium or leukocytes, and cholesterin, bilirubin or calcium-bilirubin crystals. In cholelithiasis, characteristic sediments were found, consisting of abnormal amounts of any or all of the foregoing crystalline elements. Bilestained cells, interpreted as suggesting an irritative process in the biliary tract, are also found in many of these cases. Other types of biliary tract disease, as a rule, also show abnormal cellular or crystalline elements, but with no degree of constancy, and the findings in such cases are suggestive rather than diagnostic.

M. Golob (Med. Jour. and Rec., July 16, 1924) finds that patients with symptoms of biliary stasis respond satisfactorily, on the whole, to treatment consisting of 4 to 6 biliary drainages at 6-day intervals. Some patients showed a complete, and others a partial arrest of symptoms.

The following are enumerated by G. M. Niles (Jour. Med. Assoc. of Ga., Apr., 1924) as conditions in which non-surgical drainage may either mitigate symptoms or cure certain diseased states: (1) Chronic cholecystitis or choledochitis, as indicated

by flatulence, dyspepsia, muddy skin, anorexia, constipation and malaria-a syndrome commonly known as biliousness. (2) Biliary stasis with chronic gall-bladder infection following malaria, typhoid, influenza or constipation. (3) Sick headache; in cases of long standing many drainages may be required. (4) Some forms of asthma, where the sensitization tests have not worked out satisfactorily, or where the cause is probably an infected gall-tract. (5) Infectious joint troubles, as an adjunct to other measures. (6) Chronic catarrhal jaundice, without a material obstruction, such as a large stone in the common duct. Cases operated for gall-stones or other conditions can be made much more comfortable by several drainages before and after operation. Amelioration is also afforded in various cases in which operative intervention is for some reason or other inexpedient.

BILE-TRACT DRAINAGE WITH-OUT THE DUODENAL TUBE,-According to B. L. Knight (Therap. Gaz., June, 1924), this simplified procedure is of value as a temporary therapeutic measure and an emergency treatment for the relief of certain gall-bladder pains. Where Oddi's sphincter or the common bile-duct are so edematous that bile cannot pass, the magnesium sulphate taken will first remove the congestion and then induce contraction of the bile-ducts and gall-bladder. method without the tube is available for the benefit of the gall-bladder cases that cannot be hospitalized. The procedure is as follows: If the pain is not severe, at least 4 hours without food or water should precede treatment. The patient then lies comfortably on the right side and receives 1 ounce (30 c.c.) of saturated magnesium sulphate solution in lactated pepsin, 4 doses of 2 drams (8 c.c.) each being given at 15-minute intervals. Often 1 dose will relieve the pain. Fifteen minutes after the last dose, dry toast is given. If the magnesium sulphate has removed the edema, this food causes contraction of the entire biliary tract. Results are gauged by the relief of pain and the amount of bile passed in the stools.

In catarrhal jaundice, daily treatment is indicated, with plenty of liquids taken between times.

GANGRENE.—Stephany (Deut. med. Woch., Mar. 7, 1924) observed in Odessa an epidemic of acute gangrene of the external sex organs in little girls. Various infectious diseases had preceded the gangrene.

Ardin-Delteil and Lévi-Valensi (Bull. Soc. méd. des hôp. de Paris, July 11, 1924) observed a patient with gangrene of the great toe occuring during convalescence from pneumonia. Treatment by sodium citrate proved efficient.

ETIOLOGY.—Six cases of gangrene due to deficient production of leukocyte granulation were studied by A. Leon (Deut. Arch. f. klin. Med., Aug., 1923). All occurred in women 38 to 61 years of age, most of whom became acutely ill with high fever and very soon showed local gangrenous processes of the mucosa (always in the pharynx), in 3 cases on the gums, in 3 on the tongue, in 1 in the larynx, and in 1 in the vulva and vagina. In 1 case there was also gangrenous edema of the skin of the thorax; in another, hard infiltration of the floor of the mouth without suppurative liquefaction. The blood findings were characteristic, with great decrease of the total leukocytes and extreme decrease of the granular leukocytes (even to 0). The lymphoid cells, which were decreased absolutely, made up 68 to 100 per cent. of the total count. Blood platelets were normal; there was no, or only slight, anemia. Decline was rapid, always followed by death in 3 to 14 days. On pathologic examination no constitutional anomalies were observed. The bonemarrow histologically showed paucity of white and lymphoid cells, and there were no myelocytes present. Megakaryocytes were present in normal numbers. Bacteriological examination of the blood showed in 1 case pneumococci, in 2 pneumococcus mucosus, in 3 it was negative. An unknown, probably toxic, infectious noxa was involved, which primarily injured the granulocyte apparatus.

TREATMENT .- A case of senile gangrene was treated successfully by K. Barth (Münch. med. Woch., Sept. 12, 1924). It occurred in a physician 58 years old. A gangrenous ulcer was present under the right little toe, due to arteriosclerotic intermittent dysbasia. The ultra-violet rays were used in 2 ways: (1) General irradiation with Bach's lamp, slight cutaneous erythema being maintained, and (2) sunshine irradiation of the right The induration and the ulcer were subjected to intense radiation from the quartz lamp (at 25 to 30 cm. distance) for 10 to 15 minutes. In addition, the usual Nauheim treatment was given. Considerable improvement resulted. The patient kept at work, and continued the irradiations, with some interruptions, until the ulcer healed entirely in a few months.

GAS GANGRENE.—Pilcher (Ann. of Surg., Jan., 1925), in 100 severely infected cases of gas gangrene which had been treated with Dakin's solution for 10 days or longer without any appreciable signs of improvement, used quinine sulphate, 1 Gm. (15 grains); hydrochloric acid, 0.5 c.c. (8 minims); glacial acetic acid (99 per cent.), 5 c.c. (80 minims); sodium chloride, 17.5 Gm. (4½ drams); solution of formaldehyde, 1 c.c. (16 minims); thymol, 0.25 Gm. (4 grains); alcohol (90 per cent.), 15

c.c. (½ ounce), and water, to make 1 liter (quart). The preparation was compounded as follows: (1) Dissolving the quinine in the hydrochloric and acetic acids; (2) dissolving the sodium chloride in the water, and (3) dissolving the thymol in the alcohol. No. 1 was added to No. 2, then the formaldehyde and finally the thymol solution.

C. Goodman (Ann. of Surg., June, 1924) treated successfully a case of gas gangrene of the thigh following an accident by the injection of three large doses, 100 c.c., on consecutive days, of a serum representing a mixture of Welch's perfringens form of the gas bacillus with tetanus.

HEMOLYTIC STREPTOCOC-CUS GANGRENE.—F. L. Meleney (Arch. of Surg., Sept., 1924) observed 20 cases of this condition. Most of the patients were males, due perhaps to their closer contact with dirt and greater liability to injury. The extremities were chiefly affected. In 75 per cent. of cases, the infection spread beyond the original site to a neighboring part. The disease is characterized by its very rapid development. In some cases, the process then comes to a standstill and the dead skin falls off, leaving a larger ulcer with undermined edges and granulating base. In more severe cases, the process progresses rapidly until several large areas of skin have become gangrenous, and the intoxication renders the patient dull, unresponsive, mentally cloudy or even delirious. About this time, pulmonary symptoms and signs denoting bronchopneumonia or lung abscess may develop. Metastatic abscesses may appear in any part of the body, but chiefly in the subcutaneous tissues. Positive blood cultures

with hemolytic streptococcus were present in 7 of 17 cases in which cultures were taken.

Incisions should be made from the gangrenous areas proximally and distally as far as the subcutaneous necrosis extends, but no farther. Excision of gangrenous skin should be resorted to as soon as the line of demarcation has developed to a point where the dead skin can be removed without causing much bleeding. Immediately after operation, if it is possible, the part should be put in a hot water soak at from 40 to 42° C. (104 to 107.6° F.). The heat produces a hyperemia and the toxic substances find easy exit into the water. In most cases, amputation is unnecessary, the infection being superficial.

B. Saad (Ann. des mal. vén., Apr., 1924) found that non-syphilitic gangrene of the extremities could be cured by antisyphilitic treatment. The patient was given, in 2 weeks, 4 injections of neoarsphenamin of 0.15, 0.3, 0.6 and 0.75 Gm., respectively, 4 injections of trepol and 3 injections of mercury cyanide; 10 to 15 Gm.  $(2\frac{1}{2}$  to 4 drams) of sodium citrate and 4 to 6 Gm. (1 to 11/2 drams) of iodide were given daily. When the pains diminished, the bismuthic, arsenical and mercurial treatment was resumed, the result being Spillmann had shown rapid cure. cutaneous gangrene amenable to treatment with the arsenobenzenes, and the cure of the author's case sustained Spillmann's experience.

GASOLINE FUMES, POISON-ING BY.—Henderson and Haggard (Jour. Amer. Med. Assoc., Aug. 4, 1923) urge the extremely poisonous nature of the exhaust gas from

automobiles. The air in city streets where there is considerable traffic is contaminated with this exhaust gas. The conditions in garages and repair shops are also, as a rule, extremely The horizontal autounhealthful. mobile exhaust, now generally used, mixes the gas throughout the respiratory zone of street air in a layer only about 10 feet deep. It thus dissipates the heat of the gas and prevents it from rising out of the street, while the air of a garage is rapidly mixed with exhaust gas. They recommend the use of a vertical exhaust on omnibuses, trucks, taxicabs and private cars with tops, to start the hot gas upward with comparatively little admixture of air. Its heat then carries it on up out of the street or through any ventilator in the roof of the garage.

Zangger (Schweizer med. Woch., Jan. 8, 1925) emphasizes the dangers of tetra-ethyl lead products for communities. At least 10,000 kg. of lead would be blown into the streets of Zürich in one year.

Of a party of 7 adults and 6 children on a pleasure trip in a motor boat, 9, according to Harbitz (Norsk Mag. f. Laegevid., Jan., 1924), developed symptoms of carbon monoxide poisoning. All were sitting on the open deck back of the cabin; 2 then went to lie down in the cabin where they died. A leak in the muffler allowed the exhaust gas to accumulate in the cabin. A child, aged 7, was the first to feel the effect, in half an hour after starting. Slight poisoning from exhaust gas is probably more common in garages and motor boats than is realized.

E. M. Vaughan (Med. Jour. and Rec., Oct. 15, 1924) states that the following

tannin test for the detection of CO in the blood, taken from Hawk, is delicate and practical: Divide the blood to be tested into 2 portions, and dilute each with 4 volumes of distilled water. Place the diluted blood mixtures in 2 small flasks or large test-tubes and add 20 drops of 10 per cent. solution of potassium ferricyanide. Allow both solutions to stand for a few minutes, then stopper the vessels and shake one vigorously for 10 to 15 minutes, occasionally removing the stopper to permit air to enter the vessel. Add 5 to 10 drops of yellow ammonium sulphide and 10 c.c. of 10 per cent. solution of tannin to each flask. The shaken flask will soon show a dirty olive green precipitate, whereas the flask which was not shaken and which, therefore, still contains CO hemoglobin, will exhibit a bright red precipitate characteristic of CO hemoglobin. This test is more delicate than the spectroscopic test, and serves to detect the presence of as low a content as 5 per cent. of CO hemoglobin.

TREATMENT.—According to H. W. Haggard and Y. Henderson (Boston Med. and Surg. Jour., Aug. 3, 1922), carbon monoxide is practically the sole toxic constituent in exhaust gas when pure gasoline is Gasoline is often mixed with coal distillate, which contains benzol, and produces a more toxic exhaust gas. Gasoline vapor itself acts somewhat like ethyl ether. It is an anesthetic, but the stage of excitement passes through a very narrow region of full anesthesia into convulsions and death. In the toxicity of exhaust gas unburned gasoline is not an appreciable factor. Workmen are, however, sometimes overcome when they go into a large tank in which gasoline has been stored. Benzol is much more toxic. In the treatment of carbon monoxide poisoning, the first step is the restoration of spontaneous breathing, if it has stopped. For this purpose the

manual prone pressure method of artificial respiration is better than any apparatus, and can be applied instantly. A delay of even a few minutes may prove fatal. Then, to accelerate the elimination of carbon monoxide from the blood, the inhalation of oxygen has long been recognized as the specific procedure. But after long exposure to air containing carbon monoxide respiration is very much depressed, and the oxygen has no very stimulating effect on the volume of breathing. The writers therefore use the stimulating action of carbon dioxide. A deeply asphyxiated patient who can be reached within 1/2 hour and is then given inhalations of oxygen containing 5 per cent. of carbon dioxide can practically be freed from carbon monoxide within 30 to 40 minutes.

In tests in dogs, Nicloux (C. r. Soc. de biol., Jan. 30, 1924) found that the inhalation of oxygen was the superior method of treatment in grave carbon monoxide poisoning. The experiments failed to confirm Henderson and Haggard's statement that inhalation of air combined with 5 per cent. of carbon monoxide is more effective than inhalation of pure oxygen for hastening elimination of carbon monoxide.

A case of massive intoxication by carbon monoxide treated by artificial respiration and inhalation of oxygen by Panis and Salmon (Presse méd., Mar. 26, 1924) illustrates anew the instability of carbon monoxide hemoglobin in the presence of air, and especially of oxygen, and the possibility of survival after a concentration of CO hemoglobin which in this case was certainly above 50 per cent.

H. S. Forbes, S. Cobb and F. Fremont-Smith (Arch. of Neurol.

and Psychiat., Mar., 1924) found that carbon monoxide inhalation causes in animals and in man a rise in intracranial pressure, which shows two distinct elevations: The first occurs during asphyxia and is caused by congestion due to a rise in arterial pressure; the second occurs after asphyxia and is caused probably by edema. The intracranial pressure is of sufficient height to produce transient eyeground changes observable by the ophthalmoscope. To offset this factor the authors tried intravenous injection of hypertonic saline solution, known to cause absorption of water by the blood from the tissues, obtaining reduction of the increased brain bulk and relief from compression. In man it relieved a stuporous condition, accompanied by an abnormally high spinal fluid pressure and headache, of 24 hours' duration, due to asphyxia by illuminating

GASSING IN WARFARE.— Martin (Jour. Royal Naval Med. Serv., Apr., 1924), in a review of this subject, states that the cases of gassing which occurred during the war fell naturally into 2 groups: (1) The asphyxial type with congestion, and (2) the anoxemic type with col-Type 1 is characterized by lapse. purple cyanosis, the lips, tongue and ears being blue; a large amount of frothy sputum; jerky, hurried, deep respirations, with greatly exaggerated inspiratory movements and prolonged expiration, as in asthma; a full strong pulse, with a rate seldom over 100 per minute. This type is associated more particularly with lung irritants, such as chlorine, chloropicrin and nitrous gases, which affect the upper air-passages more than the terminal bronchioles and alveoli. Type 2 is characterized by ashy cyanosis, with pale greenish face, the lips and ears being lead-colored; little coughing, and the expectoration of a small amount of fluid, until near the end; extremely rapid, shallow respiration; weak, thready pulse, usually 120 per minute or over. This type is associated with such irritants as phosgene and diphosgene, which attack chiefly the alveoli of the lung, leaving the upper air-passages almost unaffected. In this type there is no retention of carbon dioxide in the alveoli, such as occurs in Type 1, but there is marked anoxemia throughout the body. Patients who live pass through 3 more or less definite stages: (1) The asphyxial stage; (2) the quiescent, or intermittent stage, and (3) the bronchitic or bronchopneumonic Phosgene is much more stage. subtle and dangerous in its action than chlorine and chloropicrin, and when used in low concentrations its action may be delayed from 3 to 8 hours.

TREATMENT.—The first step, according to Martin, is to remove the patient immediately from the gassed area; he should always be transported lying down on a stretcher. Rest and warmth are essential. The most valuable therapeutic measure is the administration of oxygen; 2 to 3 liters (quarts) of oxygen per minute are required in ordinary cases, and as many as 10 liters per minute may be needed in the severest cases. Oxygen (40 to 50 per cent.) should be given continuously for 24 to 48 hours, the concentration being reduced as the patient recovers. Venesection should be performed early in

the blue asphyxial type, 15 to 20 ounces of blood being withdrawn; cases of the pallid, anoxemic type should not be bled. Drugs have little effect in the acute stages. Morphine is dangerous and should be given only for the control of extreme restlessness (dose, 1/6 grain-0.01 Gm.). Other useful cardiac stimulants are brandy, pituitrin, camphor and caffeine. Expectorants should not be given during the first 48 hours. After exposure to nitrous gases, men should be taken off duty and watched for 10 to 12 hours, as this form of poisoning is often late in manifesting itself.

SEQUELÆ.—Brelet (Bull. Soc. méd. des hôp. de Paris, Nov. 2, 1923), in a study of the sequelæ of war gas intoxication in 50 cases of gassed soldiers, found nothing abnormal even on radiography in the respiratory apparatus. Only 3 had pulmonary tuberculosis, while 33 presented the syndrome of dry catarrh with pulmonary emphysema. Nevertheless, these subjects were in good general condition and bacteriologic examinations always gave negative results.

H. L. Gilchrist (Milit. Surg., Aug., 1924) states that of 1036 applications for compensation filed by ex-soldiers in the Veterans' Bureau, Washington, D. C., 352, or 34 per cent., attributed their disability to the sequelæ of warfare gases; 103 did not inhale enough gas to require medical treatment. A large percentage stated they did not know when they were gassed, and 45 were so slightly gassed as to require only first-aid treatment. It seems established in the minds of many, including physicians, that all who were exposed to the fumes of warfare

gases will. sooner or later, develop tuberculosis. A careful analysis, which required over 2 years, failed to show that lung lesions caused by gas predisposed to tuberculosis or that it increased the tendency for tuberculosis to localize in the lungs.

#### GASTRIC ULCER.—DIAGNO-

SIS.—A swollen and inflamed condition of the superior and inferior gastric lymph-glands is an almost infallible sign of gastric ulcer, according to E. Schneider (Zent. f. Chir., Oct. 4, 1924). In every instance he found several small ulcers, in addition to the expected gastritis. The inflamed glands are the expression of the accompanying gastritis, irrespective of whether the gastritis or the ulcer was primary. The stomach shows at operation enlarged lymphatics along the greater curvature, numerous in proportion to the accompanying gastritis. Old healed ulcers do not, however, cause them.

Flörcken (*lbid.*, Jan. 3, 1925) found lymphadenitis in 57.8 per cent. of 196 operative cases of gastric or duodenal ulcer. Of these, 71.2 per cent. were in cases of ulcer of the lesser curvature. This condition is valuable in diagnosis and in connection with other symptoms as an indication for resection.

O. Mueller (Münch, med. Woch., May 2, 1924) urges that patients with gastric ulcer always show some abnormality in the structure and function of the smallest arterioles, capillaries and venules, distributed in irregular patches over the body. This was especially pronounced in the lesser curvature and pyloric region. It tends to indicate a vasoneurotic origin of gastric ulcers.

The capillaries of the mucosa of the lower lip on 200 subjects were studied by Mayer-List (Münch. med. Woch., May 2, 1924). While 29 per cent. suffering from organic and vasomotor affections had marked changes, all the 20 patients with gastric ulcer presented remarkable irregularities.

Striking differences in the vessels were observed by O. Mueller and H. Heimberger (Deut. Zeit. f. Chir., Aug., 1924) in 18 stomachs that had been resected for cancer, 4 for duodenal ulcer, and 28 for gastric ulcer. In the ulcer cases the capillaries invariably presented evidence of a constitutional predisposition to stasis in the finer blood-vessels. This explains the development of an ulcer when some exogenous influence permits self-digestion. This vasomotor defect was always evident in other regions (lips, skin, etc.). It could not be discovered in 13 of the 18 cancer patients; in the other 5, the cancer had developed on the basis of an ulcer. It could not be detected in the stomach of persons free from ulcer and cancer.

Duschl (*Ibid*.) confirmed, in a study of 146 resected stomachs, the abnormalities of shape and size of the capillaries in the gastric mucosa in ulcer cases. The capillaries were found to twist and branch abnormally, thus displaying a local preparciness for disease. His findings thus confirm those of Mueller and Heimberger.

In the differential diagnosis of ulcer from cancer, based on 68 fluoroscopic studies, Roux (Revue méd. de la Suisse rom., July, 1924) calls attention to the frequent early adhesion of the stomach to the pan-

creas in ulcer, drawing the stomach into the shape of an inverted L. Cancer does not form such organdisplacing adhesions early. simple ptosis, the stomach retains its I or fishhook shape, to the left of the umbilicus. Cancer of the pylorus averaged 15 to 18 months' duration before the patients reached the surgeon; in other gastric cancers the intervals averaged much longer. Displacement of the pylorus toward the right suggests ulcer in the pylorus or duodenum, the cicatricial shriveling of the resulting early adhesions pulling the pylorus toward the 1 fixed point in the region, the hilus of the liver. This keeps close to the diaphragm. One should distinguish a casual sagging into the right side from active, continuous traction on the pylorus. The adhesions pulling the pylorus into the right side may have their source in an inflammatory process around the bile-ducts, even when the gall-bladder itself does not show much disturbance. He regards this surrounding inflammatory process as the gravest complication of cholelithiasis, aside from perforation.

R. T. Vaughan and W. A. Brams (Surg., Gyn. and Obst., Nov., 1924) found free gas in the peritoneal cavity on X-ray examination in 13 of 15 cases of anatomically proved acute perforation of gastric or duodenal ulcer. This is rarely observed in any other condition which can be confused with perforated gastric ulcer. The free gas was noted as early as 2 hours after the acute perforation occurred. Only a small quantity of air is necessary for its demonstration. It is demonstrated by observing a clear, distinctly bright zone which shifts on change of posture of the patient. The sign is of great value. It makes possible an early and definite diagnosis without danger or discomfort to the patient.

According to J. R. Bell (Arch. of Intern. Med., Nov., 1923), it has become necessary to modify and even to abandon many former beliefs regarding the alterations in gastric acidity in gastric and duodenal ulcer. was the general opinion that both types of ulcer were most frequently associated with hyperacidity, yet in most instances it is impossible to predict with any degree of certainty the state of the gastric acidity from a consideration of the symptoms The results obtained by alone. fractional gastric analysis have demonstrated that, whereas duodenal ulcer is most frequently associated with an increased acidity, it is not uncommon to find low or normal acidities. Gastric ulcer, on the other hand, is usually found to have diminished or even absent acidity.

In a personal series of 27 cases of gastric ulcer, 22 were demonstrated at operation, and 5 were seen as definite niches by the X-rays alone. Of the 27 cases, 4 (14.8 per cent.) showed achlorhydria, 5 (18.5 per cent.) low normal acidity, 8 (29.6 per cent.) normal, and 7 (25.9 per cent.) high normal. There were no cases of hyperchlorhydria.

According to F. J. Kaiser (Zent. f. Chir., June 21, 1924), recent theories do not explain the first superficial lesion in the gastric mucosa. Fatigue hypotonia he regards as the most frequent but not the only cause of gastric ulcers. Stretching of the vessels from various causes (especially in persons in whom the blood supply is barely adequate), narrows

the lumen and reduces to a dangerous level the local blood supply. The necrotic mucosa is attacked by the gastric juices, starting an ulcer.

In an experimental study of gastric ulcer, L. R. Dragstedt and A. M. Vaughan (Arch. of Surg., May, 1924) found that in dogs an experimental ulcer may increase the secretion of gastric juice brought about during the digestion of a meal, but a true hyperacidity, in which the gastric secretion shows a higher concentration of hydrochloric acid than is found in normal pure gastric juice, never occurred.

ETIOLOGY.—In a study of focal infection and elective localization in ulcer of the stomach and in arthritis, T. Nakamura (Ann. of Surg., Jan., 1924) states that of 9 patients with gastric symptoms, 5 had undoubted ulcer findings and 4 had severe hemorrhages, presumably due to acute ulcers. Of 66 rabbits inoculated with strains from tonsils of these patients, 46 (70 per cent.) had hemorrhage or ulcer, or both, in the mucous membrane of the stomach. Only 1 of the 9 strains gave negative results. Lesions occurred in the pylorus in 20 (43 per cent.) of the positive rabbits, along the lesser curvature in 18 (40 per cent.), along the greater curvature in 10, and in the fundus in 13. A streptococcus similar to that found in the pus from the patients' tonsils and in the extirpated tonsils was isolated from both the hemorrhagic and the ulcerated areas in the stomachs of the rabbits. The microscopic changes in the lesions consisted mainly of a variable degree of sharply localized interstitial infiltration by erythrocytes, leukocytes, eosinophiles and round cells.

R. T. Morris (Med. Jour. and Rec., Feb. 20, 1924) contends that the 3

most salient features of the gastric ulcer question appear to be terminal arteries, elective affinity for toxins, and sensitization. To these may perhaps be added endocrine dysfunction and wrong hormone production. Toxins may produce either endarteritis of the terminal artery with exudative closure of its lumen or spasm of its walls, the end-result in either case being a small area deprived of normal blood supply. This means that it may be attacked on the one side by digestive ferments or microbes, and on the other by excessive production of antibodies, which are capable of producing a lysis of structures in the involved area. In regard to elective affinity for different toxins, those which appear in the midgut area may vary in character in such a way as to cause quite different types of ulcer demonstration. For example, toxalbumin from a burn of the skin or cytase from the developing ovum in a pregnant woman may cause ulcer to appear in the duodenal area. On the other hand, antigens from foci of infection in the tonsils, teeth or colon may cause ulcer formation much more frequently in the affinity area of the pylorus. Individuals who have been sensitized in some way may subsequently become immune and recover from the tendency to develop midgut ulcers.

Mattison (Hygiea, May 31, 1924) compared the reported cases of traumatic ulcer of the stomach with 25 of his own 1650 gastric ulcer cases. The course and ultimate outcome did not seem to differ materially from ulcer not due to trauma. The best results were invariably obtained when the stomach had been previously sound, the prognosis growing more unfavorable the longer the symptoms had lasted. Only 10 of the total 25 were free from disturbances 5 years later. The prognosis evidently depends on the promptness with which treatment is begun.

The frequent coexistence of tuberculosis, mostly of the lungs, with ulcer of the stomach is urged by A. Cade and P. Ravault (Arch. des mal. de l'app. dig., July, 1924). Tuberculosis was present in 39 of their 139 cases of gastric ulcer, preceding or accompanying the ulcer in 34 instances. While the diseases are independent as different localizations of the same infection, the infection or toxemia produces an endarteritis, obstruction of the vessels, and consequently ulcer.

Pregnancy was found by Szenes (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., 37, 652, 1924) to ameliorate the discomfort of gastric and duodenal ulcer. He attributes this to a lowered acidity of the gastric juice, change in the position of the stomach, and fattening. Experiments on dogs showed a somewhat greater tendency toward healing in the gravid animals. Conversely, menstruation increased the discomfort only in a few women, while the menopause seemed to aggravate the disease.

Smithies TREATMENT.—F. (Amer. Jour. Med. Sci., Dec., 1923) describes a method of non-surgical clinical management which is simple, inexpensive, easily borne, and shortens the period of hospitalization. It consists in rest in bed for 1 to 3 weeks, physiologic rest to the stomach by avoidance of food and irritating medicines by mouth, gastric lavage and frequent examinations. Painful spasms are prevented by continuous application to the abdomen of hot compresses of alcohol and boric acid. Abstinence from food by mouth should be insisted upon for from 3 to 7 days. The chewing of paraffin wax will relieve dryness of the mouth, thirst and painful gastric spasm. During the fast, rectal feedings are given, consisting of 300 to 600 calories in 1000 c.c. of saline solution in 24 hours. The author uses an enema of 1 ounce (30 c.c.) of 50 per cent. alcohol, 1 ounce of glucose, and 240 c.c. (1/2 pint) of salt solution, given by the drop method. When feeding by mouth is begun, carbohydrates in liquid form should be given in small quantities and frequently. Milk is not given as a routine. Overproduction or overaccumulation of free gastric acid is prevented by keeping the stomach food-free as described. Medicines are administered largely to counteract discomfort due to 3 main causes: Painful gastrospasms (belladonna or bromides in the enemas); accumulations of overacid gastric contents and peristaltic unrest (calcined magnesia), and acute pain of perforation (morphine, with prompt surgery). Constant seepage of blood, demonstrated microscopically or clinically, is an indication for early abdominal section. The bowels are kept open by the use of simple enemas every other day.

The Sippy method is regarded by Richet, Jr., and de Fossey (Rev. de méd., Sept., 1923) as better than the usual methods, but they prefer extragastric alkaline treatment, conducted as follows: A solution containing 7 Gm. (13/4 drams) of sodium bicarbonate and 10 drops of laudanum in 500 c.c. (1 pint) of water is introduced rectally, drop by drop. On the 1st day, 2 such treatments are given, the diet consisting of water, to which on the 2d day some milk is added, treatment being the same. On the 3d and 4th days the diet is 1 liter (quart) of milk and water. On the 5th and 6th days, 1 rectal treatment and 1 liter of milk, with milk soup toward the end of the period, constitute the treatment. From the 7th to the 14th days, 2 rectal instillations are given every other day, and 5 small meals of milk, eggs and soup are permitted daily. From the 3d to the 4th week, 1 rectal instillation is given every 2 days, the diet being enlarged. Rectal treatment is discontinued about the end of the 1st month. If some discomfort occurs in the absence of rectal treatment, 3 or 4 Gm. (3/4 to 1 dram) of prepared chalk may be used daily by mouth. This treatment promptly relieves pain and permits early use of nourishing food. It is also excellent in preparing for operation, and is contraindicated only in renal insufficiency, rectocolitis and in a few cases of special sensitiveness of the colon.

H. L. Bockus (Jour. Amer. Med. Assoc., Feb. 2, 1924), hoping to shorten the duration of medical care in these cases, used a plan of treatment differing from that of Einhorn in the following particulars: (1) The feedings are introduced into the jejunum and not into the duodenum. (2) Alkalies are administered by mouth between feedings, every 2 hours instead of 3 times daily. (3) After the tube is removed the patient is brought back more gradually to a full diet. The 10 patients thus treated had all the classic signs and symptoms of peptic ulcer of the stomach or duodenum, with X-ray confirmation. Seventy per cent. of these cases are clinical cures to date. No definite reduction in stomach acidity was observed under 6 months after the tube treatment. There was complete absence of occult bleeding after treatment in 90 per cent. of the cases. The author concludes that jejunal alimentation is a valuable adjunct to the medical treatment of peptic ulcer.

When patients cannot afford to leave their occupation, Boas (Deut. med. Woch., June 13, 1924) uses the following treatment: Only fluid food (milk, cream, soups, soft eggs) the first week. If there is improvement, zwieback or white bread in milk is added. Mashed potatoes, sweet cooked fruits or thick gruels enlarge the diet in the 3d week. The 4th

week the patient can have mashed vegetables, omelets, white cheese and white bread and butter. The caloric value does not need to be high before the occult bleeding stops. Half an hour before meals the patients are given a teaspoonful of a mixture of sodium bicarbonate, magnesium oxide (or carbonate in diarrhea), and extract of hyoscyamus. Relief is felt within 1 or 2 weeks, and the occult bleeding ceases in from 4 to 6 weeks. Only grave hemorrhages require the bed treatment.

Pribram (Deut. med. Woch., Jan. 23, 1925) reports 50 to 70 per cent, of good results in both gastric and duodenal ulcers from protein injections. Ulcers of the lesser curvature, including the penetrating type, gave the best results. Recurrences occurred in a few 4 months later, but yielded on resuming the treatment. He gives 10 intravenous injections in increasing doses, 2 or 3 days apart, and repeats the series after 4 to 6 weeks. The distinct reaction observed means success. Tuberculosis is a strict contraindication. Repeated duodenal hemorrhages require surgical interventionresection, if possible.

The connection of gastric ulcer with excessive pepsin output was studied by A. Günzburg (Arch. f. Verdauungskr., June, 1924) in tests on 350 patients. Of these, fully 66 per cent. showing extra potent pepsin content proved to be ulcer cases, and hyperpepsinia was noted in 48 patients out of 55 with ulcer of the stomach. The author holds that the excess of pepsin creates a predisposition to ulcer. In such cases he uses atropine with good result.

Udaondo (Prensa Med. Argent, July 20, 1924) had 15 cases of gastric ulcer showing complete achylia. It was generally accompanied by arterial hypotension, bradycardia, general asthenia or chronic constipation, and in 2 of the cases by phosphaturia. The symptoms from the ulcer were generally milder than in cases with normal or excessive acidity. Sippy treatment is not indicated in these achylia

cases, but the writer has always had good results with small doses of sodium chloride and sodium citrate or phosphate, associated with sedatives and dieting.

X-RAY TREATMENT.—Matoni (Med. Klin., Sept. 9, 1923) applies the X-rays in all gastric and duodenal ulcers, except indurated ulcers and those with stenosis. He had over 75 per cent. of recoveries among 140 patients. The acidity was reduced permanently and the pain diminished.

SURGICAL TREATMENT.—The mortality rate of perforated gastric and duodenal ulcers has been much reduced since Speck's compilation of 3224 cases with a mortality of 42 per cent. H. Engelsing (Deut. Zeit. f. Chir., June, 1924) attributes this to earlier diagnosis. In the last 4 years his own 38 cases gave a mortality of 6.2 per cent. in the 15 cases in which the operation followed in less than 6 hours, and 60 per cent. when 24 hours or more had elapsed. He did no section, but merely closed the perforation with a double row of stitches, and reports complete relief from all disturbances to date. Hence, he holds, the wisdom of conservative measures.

Bastianelli (Policlinico, Aug. 25, 1924) opposes gastro-jejunostomy for ulcers of the *lesser curvature*, but resection gave excellent results in 38 patients, there being but 1 death.

Malignant degeneration occurs so often, according to Finsterer (Arch. f. klin. Chir., Sept. 23, 1924), that resection of a gastric ulcer may be deemed an early operation for cancer. It is impossible, he thinks, to determine whether cancer is already installed, even with direct microscopic examination. More helpful is the

conversion of ulcer symptoms to those of the onset of malignant degeneration, notably the subsidence of the hyperacidity disturbances, the total loss of appetite, and the dislike of meat. Internists, even those who otherwise oppose operative treatment of chronic ulcer, should be on the watch for these indications of encroaching cancer, for under these circumstances at least  $\frac{2}{3}$  of the stomach must be removed.

Duval (Bull. de l'Acad. de méd., Nov. 25, 1924) urges that an operation on an *infected ulcer* of the stomach may be complicated by peritonitis, defective healing of the wound or perigastric suppuration, as well as by bronchopneumonia—the latter sometimes erroneously ascribed to the anesthetic. Only patients without or with very mild infection should be operated.

TREATMENT OF HEMORRHAGE.

—In gastric and duodenal ulcer Strandgaard (Hospitalstid., Apr. 23, 1924) finds that transfusions of blood in profuse hemorrhage improve the general condition, pulse, blood-pressure and hemoglobin percentage, besides promoting coagulation. In 6 personal cases the benefit was prompt and striking.

In acutely bleeding gastric ulcer, Erkes (Zent. f. Chir., July 12, 1924) ligates en masse the bleeding ulcer, inverts and sutures it. In 3 cases of chronic recurring bleeding ulcers and in 3 of acutely bleeding ulcers, no further bleeding followed in from 1 to 3 years. In 19 other cases, there was occult bleeding from gastric or duodenal ulcers. In only 1 case did postoperative bleeding of the ulcer occur; in this case no ligature had been applied.

In hemorrhagic ulcer, Piccinini (Policlin., June 30, 1924) considers **Balfour's operation** the best if the site is an easily accessible one.

Palpation and pinching of, and traction on, the stomach wall at operation is warned against by A. Wagner (Zent. f. Chir., June 7, 1924), who observed several fatalities from this cause. Hemorrhage and perforation of the stomach wall may be thus induced. This applies mainly to conservative intervention, in which as little of the stomach wall as possible is removed.

## GASTROENTERITIS. See DIARRIHEA; INTESTINE; STOMACH.

### GASTROENTEROSTOMY.--

According to Ohly (Arch. f. klin. Chir., exxviii, 505, 1924), gastroenterostomy is unphysiologic and does not prevent bleeding or perforation. Of 49 ulcer patients treated by it and followed up for years, only 38.3 per cent. were permanently cured.

In a study of the cause of certain acute symptoms following gastroenterostomy, R. L. Haden and T. G. Orr (Johns Hopk, Hosp. Bull., Jan., 1923) found in 3 cases a high level of non-protein nitrogen of the blood, low blood chlorides, and suppression of chloride excretion after the operation. One patient had a marked alkalosis; 2 had a carbon dioxide combining power at the upper limit of normal when first determined. Two also had a very high nitrogen excretion in the urine. All 3 presented clinical symptoms of a severe intoxication. The clinical picture and laboratory findings are believed to be due to an intoxication arising in the upper intestinal tract.

L. Freeman (Ann. of Surg., Feb., 1923) contributes an improved technic for gastrectomy and gastroenterostomy. He uses 2 mattress needles which are about 1 foot in length; 4 Allis forceps and several ordinary rubber bands about ½ inch in width. In gastroenterostomy, after exposure of the stomach and jejunum, a fold is picked up from each with the Allis forceps and these folds brought alongside each other

in the position in which they are to be united. A mattress needle is then placed well down on either side of the folds, pressing them closely together into 2 prominent opposed pouches, such as are formed when forceps are used. While the needles are held in place by an assistant, a rubber band is wound around their ends on either side, tightly enough to bring the elasticity of the bands into play, and clamped with forceps. The operation is then completed as usual.

According to Bonar (Lancet, Aug. 9. 1924), gastrojejunostomy allows the stomach to empty more quickly than usual (except in some few cases of duodenal ulcer). The meal leaves via the stoma and in only a very few cases via the pylorus as well. Particularly is the rate of emptying increased in cases of pyloric stenosis, whether due to ulcer or growth, and this is very marked in cases of partial gastrectomy with gastrojejunostomy, where the meal passes at once into the jejunum. Gastrojejunostomy in cases of gastric ulcer causes a reduction in the free hydrochloric acid value, but the total acidity remains much as before.

### GASTROPTOSIS. See STOMACH, Prosis.

GENU RECURVATUM.—C. H. Heyman (Jour. of Bone and Joint Surg., July, 1924) uses a modified Edwards operation for reconstruction of the lateral ligaments. Instead of constructing bands with attachments at the normal sites of attachment of the lateral ligaments, he secures the femoral attachment as far posterior on the femoral condyles as possible, as well as on the medial side to obtain an anterior attachment on the tibia.

GENU VALGUM.—In rachitic genu valgum, Crainz (Policlin., Aug. 21, 1922) slowly models the knee, gradually forcing it into the normal shape, in from 6 to 10 months. The plaster used holds the correction

gained at each sitting, and is renewed each time, i.e., at intervals of 2 to 3 weeks. He manipulates the joint so gently that anesthesia is not required. The correction is perfect and continuous.

GERMANIUM DIOXIDE.-J. E. Nowrey, Jr. (Bull. Johns Hopk. Hosp., June, 1924) states that the more recent studies have shown that when injected subcutaneously, germanium is relatively non-toxic and non-corrosive to the tissues of the albino rat. It causes a marked increase in the number of erythrocytes in the circulating blood without the appearance of any nucleated red corpuscles. This polycythemia is not due to a concentration of blood plasma, but to an increase in the number of nucleated red cells in the bonemarrow. Repetition of these experiments, using a fresh solution of germanium dioxide made up in distilled water without the addition of any alkali, gave different results. Study of the relative effects of administration of the dioxide in neutral solution and in a solution first made alkaline showed that germanium dioxide in neutral solution has no value as an erythropoietic agent, and that a solution of sodium germanate is an effective means for the production of an experimental poly-

[See also Anemia, Pernicious.]

GLANDERS.—Tomovici and Dumitrescu (Spitalul, July-Aug., 1923) observed a case of hyperacute glanders in man with the portal of entry in the conjunctiva. The laboratory diagnosis was confirmed at autopsy, in which the findings were as follows: Numerous partly suppurating nodules in the upper lobes of the lungs; septic enlargement of the spleen; pancreas soft and hyperemic; liver slightly enlarged; milky spots on the pericardium; scrotum edematous and partly gelatinous; the right testicle showing a central focus of softening with hemorrhagic marginal parts. Glanders bacilli could be cultivated from the lungs, spleen and testicle. The histological findings were not characteristic.

In 1 of 2 cases described by Couréménos and Kéchissoglou (Bull. Soc. méd. des hôp. de Paris, June 9, 1922), the patient was a physician, who had operated on the 1st case without gloves. The incubation period was only a few hours. The symptoms during the first week in both cases were merely those common to any grave general infection. The significant phlegmons in the neck and the abscess in the popliteal region did not develop until the 8th and 9th days.

A. Reverdin and A. Grumbach (Ann. de méd., Jan., 1924), in 2 cases of *chronic* glanders appearing in the feet of 2 brothers, aged 23 and 25, isolated from the lesions and pus a bacillus not strictly aërobic, negative to the Gram stain, and staining with fuchsin and methylene blue. Inoculation tests were made on cats, rabbits and other animals. The bacillus tended to produce necrosis rather than granuloma. It seems to have been an attenuated form of the *Bacillus mallei*, for which the authors suggest the name *B. paramallei*.

GLANDULAR FEVER.—S. Stalberg (Med. Jour. and Rec., Jan. 16, 1924) observed an epidemic of 6 cases of glandular fever in 1919 in a rural community of northwestern Pennsylvania. It was characterized chiefly by cervical adenitis and lymphocytosis. It began after an incubation period of about 7 days, with fever, nausea, occasional vomiting, and a heavily coated tongue. On the 2d or 3d day a tender swelling

was observed, usually on the left side of the neck, due to inflammation of the deep cervical glands beneath and anterior to the sternomastoid muscle at about the middle of its length. This swelling remained stationary for several days and then slowly sub-The fever and acute symptoms abated after the 5th or 6th day. Complications were few, and the prognosis is good. Leukocytosis of 17,000 to 20,000, due mainly to an increase of lymphocytes to 75 to 85 per cent., with many of the cells of the Riedel or bilobar type, was noted. In the only case in which a necropsy was made, the glands showed hyperplasia of the parenchyma with inflammatory changes. The condition closely resembles both forms of plague, but especially pestis minornow known to be bacteriologically a variety of plague.

Study of 25 cases in a boys' school led H. L. Tidy and E. C. Daniel (Lancet, July 7, 1923) to conclude that glandular fever is a clinical entity identical to infective mononucleosis. Recovery is permanent, and there is no relation to leukemia, Hodgkin's disease or tuberculosis.

In an epidemic of over 100 cases, R. Gilbert and M. B. Coleman (Amer. Jour. of Hygiene, Jan., 1925) studied 63 cases with regard to family groups, sex, age, date of onset, symptoms and duration of illness. Thirty-nine of the 43 children in these families, or 90.6 per cent., and 15 of 32 adults, or 46.8 per cent., developed the disease. Blood serum from 2 convalescents failed to agglutinate B. melitensis and B. tularense. Cultural examinations were made on throat cultures and 1 specimen of pus from an axillary gland. Strepto-

coccus hemolyticus was isolated from the pus and from 4 of the 7 throat cultures. Streptococci producing methemoglobin were present in all except 1 of the 7 throat cultures.

GLAUCOMA.—ETIOLOGY.—J. Imre, Jr. (Arch. of Ophth., May, 1924) studied the endocrin origin of primary glaucoma in 31 cases and concluded that a very large percentage of primary glaucomas are based on constitutional anomalies. In 27 of the 31 cases one or more endocrin glands were degenerated or underdeveloped. Extract of the gland at fault was administered and in many of the cases it reduced the tension. When the endocrin system was normal, organotherapy had no effect.

TREATMENT.—Lundsgaard (Hospitalstid., June 18, 1924) recalls the cases reported by Fromaget and Hamburger in which they arrested acute glaucoma by subconjunctival injection of adrenalin in a weak solution of procaine. There seems to be no doubt that adrenalin reduces the tension in the eye.

In a case of acute glaucoma, E. A. Heimann (Med. Klin., May 25, 1924) injected under the conjunctiva 0.2 c.c. (3 minims) of a 0.1 per cent. solution of adrenalin. After 48 hours he gave another injection of 0.4 c.c. (6 minims). The patient, who was also being treated with eserine, recovered in a few days.

Kadlický (Casop. lek. Cesk., July 12, 1924) recommends Hamburger's subconjunctival injection of adrenalin on the day before the operation in glaucoma.

J. J. Corbett (Boston Med. and Surg. Jour., June 26, 1924) concludes after trial that in some cases of glaucoma, radium definitely lowers the intra-ocular tension, and that its use is sometimes accompanied by an improvement in vision.

GLUCOSE.—Glucose was found by Latzel (Wien. klin. Woch., June 28, 1923) to enhance bactericidal action. He recommends an intravenous injection of 20 c.c. (5 drams) of a 50 per cent. solution of glucose previous to the application of drugs given for the purpose of exerting a sterilizing action.

H. Pfeiffer and F. Standenath (Klin. Woch., Jan. 15, 1925) prolonged by glucose injections the life of animals which had been nephrectomized, burned or injected with trypsin or otherwise poisoned by protein cleavage products. The treatment was ineffective in animals with fatty infiltration of the liver.

From a series of experiments in vitro, Iacono (Rif. med., June 9, 1924) concludes that solutions of glucose, when used as vehicles for vaccines, not only diminish the toxicity of the infecting microörganism, but stimulate and increase the production of defensive antibodies, such as agglutinins.

Glucose tolerance and its value in diagnosis was studied by John (Jour. of Metab. Research, Sept.-Oct., 1923) in a large number of cases. He found that in non-diabetics the maximum increase in the blood sugar concentration appeared promptly after the ingestion of glucose, viz., in 58.1 per cent. (50.9 per cent. in the 1st series) in ½ hour; in 33.2 per cent. (36.8 per cent. in the 1st series) in 1 hour, and in only 8.3 per cent. in 2 hours. In diabetics the rise in blood sugar concentration was slow, as was also the return to the normal level. In only 3.8 per cent. (4.6 per cent. in the 1st series) did the maximum rise appear 1/2 hour after ingestion of glucose; in 15.4 per cent. (32.5 per cent. of the 1st series) it appeared at the end of 3 hours and in 3.8 per cent, at the end of the 4th hour. The maximum increase in blood sugar concentration in all the cases was reached at the end of 1/2 hour in 30 per cent, of the cases.

**GENERAL PARALYSIS.** See Paralysis, General.

GLYCOSURIA.—The relations between glycosuria and the endocrin organs are receiving increasing attention. According to P. L. Marsh (Jour. of Lab. and Clin. Med., July, 1924), by far the larger number of patients with glycosuria are suffering from disturbances of these organs. The condition is a common feature of hyperthyroidism and of exophthalmic goiter, and with patients presenting these syndromes hyperglycemia is the rule. Patients with acromegaly or pituitary gigantism frequently have glycosuria; these conditions are both believed due to hypersecretion of the hypophysis, and there is evidence that the glycosuria is due to hypersecretion of the posterior lobe. The secretion of the adrenals has recently become of clinical significance because it has been suggested as an antidote for insulin hypoglycemia. Adrenalin administered subcutaneously causes a discharge of glycogen from the liver into the blood, and in normal animals there may be sufficient hyperglycemia to cause glycosuria. Its success as an antidote for insulin is not, however, uniform.

W. Langdon Brown (Lancet, Jan. 12, 1924) also urges that glycosuria may depend on disturbances of endocrin organs. In exophthalmic goiter there is a marked rise of blood sugar following the administration of sugar. There may be no glycosuria because of the rise of kidney threshold, but if this raised level is exceeded glycosuria follows. Patients with hyperthyroidism may develop diabetes if they have hyperglycemia long enough to damage their islets. The thyroid rather than the glycosuria should be treated. The essential features are rest, physical and emotional; removal of septic foci, particularly in the tonsils and bowels, and administration of quinine hydrobromide in doses of 3 to 5 grains (0.2 to 0.3 Gm.) t.i.d. The dietetic restrictions need not be very drastic, as a rule.

Another type of glycosuria is associated with high tension in later life, and is apt to occur in overworked nervous people. This nervous type may be of adrenal origin, the adrenalin being activated through the emotional nervous system and in turn acting on the sugar-storing process. There is no proof of this, however. It is usually

sufficient to deprive such patients of sugar as such, while allowing them a reasonable amount of starch. Since starch is assimilated more slowly than sugar, the mechanism for storage of glycogen will not be suddenly overtaxed immediately after food. The most important part of treatment is a holiday and attention to general hygiene.

Pituitary glycosuria is due to overaction of the pars intermedia, but is often associated with signs referable to other portions of the organ. It may be intermittent, since the organ seems to be rhythmic in its function, while characteristic of the blood is the slow rise and equally slow fall of sugar, giving a rounded blood sugar curve. The glycosuria of pregnancy is due to the stimulating effect of the latter on the pituitary, which then directly inhibits the internal secretion of the pancreas. No difficulty is experienced in recognizing cases of glycosuria with frank pancreatic disease. There is fatty diarrhea due to an excess of unsplit fats, and there may be creatorrhea. The output of urinary diastase is increased to 50 units or more, and the adrenalin eye test may be positive. These signs are not often found in ordinary diabetics.

The writer's view of true diabetes is that its pancreatic origin is still unproved, and that it is due to a more profound metabolic disturbance than that evoked by 1 endocrin gland. All cases are, however, ultimately associated with insufficiency of pancreatic internal secretion, since hyperglycemia, if not caused by deficiency of the islets will, at any rate, damage them in time

According to E. Geiger (Arch. f. d. ges. Physiol., ccii, 629, 1924), various indications point to the thyroid as playing a rôle, as increased production of thyroid substance is an essential condition for asphyctic protein decomposition, although subcutaneous administration of protein splitproducts produces glycosuria. Glycosuria does not occur after illuminating gas poisoning in thyroidectomized dogs. It appears that this absence of glycosuria is due to a change in renal function dependent on thyroidectomy. Subcutaneous injection of adrenalin produces the same degree of hyperglycemia in thyroidectomized dogs as in normal animals, but the rise in the blood sugar curve is not so steep in the operated animals. If in these the adrenalin is administered intravenously, the blood sugar curve is normal. Hence the delay in the rise of blood sugar is evidently a manifestation of decreased rapidity of absorption. Glycogen katabolism and sugar mobilization are evidently not inhibited by loss of the thyroid.

H. F. Host (Jour. of Metab. Research, Sept.-Oct., 1923) distinguishes 2 kinds of sugar excretion in the urine: 1. Physiologic sugar excretion, which has no relation to the amount of glucose in the blood and which comprises sugars whose nature is not known, but which probably do not include glucose. After meals consisting of bread, as well as in urine that is concentrated, these physiologic sugars may occur in such quantities that the reduction reactions commonly employed are positive. 2. Pathologic sugar excretion, caused by the passage of the glucose of the blood into the urine when the blood sugar concentration exceeds the renal threshold. Similarly, I. Greenwald, J. Samet and J. Gross (Jour. of Biol. Chem., Dec., 1924), of the Harriman Research Laboratory in New York, have concluded that the sugars excreted in normal urine are made up of carbohydrates that are non-assimilable or assimilable with difficulty, and of reducing substances derived from the protein of the food and from endogenous sources. The nature of those in the former group depends on the diet. This group may include lactose from milk, pentoses from fruits, and carmelized sugars and dextrins. The amounts of all these are usually small. On ordinary diets, at least 1/2 of the sugars of the urine originates from the protein of the food or from endogenous sources.

GOITER.—The numerical development of this disease in the United States seems steadily on the increase. According to the Department of Health of Chicago, it is estimated that at least 200,000 of its citizens suffer from preventable goiter, the greatest number occurring below the age of 16 years. The suggestion is offered that iodine be

administered to the school children. The iodine content in the water of Lake Michigan being 0.281 to 0.681 parts per billion, Chicago is placed in the area of lowest iodine content and highest goiter incidence in the United States. Its Health Department found 9026 children among 145,465 examined to have goiter, and carrying this proportion through the total number of school children it is estimated that there are about 35,000 children of school age suffering from some form of thyroid enlargement.

Marine and Kimball having shown in the school children of Akron, Ohio, that goiter could be prevented by the use of sodium iodide, while the Japanese are practically immune to goiter because of the use of seaweed as a food, other Health Departments have been led to determine the existence of goiter in different localities and, where found, to study the iodine content of the water supplies. goiter survey of the school children of Grand Rapids, Mich., showed that of 26,215 pupils examined, 30 per cent. had enlarged thyroids. Sixtyseven per cent. of those affected were girls. The ratio of boys to girls was thus about 1:2, although the moderate and marked enlargements were probably in about the same ratio that Kimball found (1:6). Above 10 years of age, the number of girls affected was about 21/2 times the number of boys. In high schools, the percentage of pupils affected ranged from 39 to 60.

DIAGNOSIS.—In the diagnosis of a pathologic condition of the thyroid gland its functional activity, according to Kimball (Jour. Mich. State Med. Soc., Sept., 1923), and not its size, should be considered. In

a large firm gland of recent development, with no exophthalmic goiter, the condition is an active hyperplasia which needs only iodine, in doses of a few milligrams daily, to effect involution to the colloid or resting stage. In large goiters in adults, each case should be considered as a potential hyperthyroidism and a sufficiently small amount of iodine given, the patient being carefully observed at definite intervals. A dose of 10 mg. (\frac{1}{6} grain) of iodine daily for 30 days should be the maximum amount given to any patient during a single period of administration.

N. W. Gillette (Med. Jour. and Rec., Aug. 20, 1924) states that in the majority of cases the diagnosis of goiter does not present serious difficulties. The parenchymatous goiter of adolescent girls seen in locations where goiter is endemic is a benign enlargement that disappears in early adult life. The early symptoms may be difficult to differentiate from a neurosis, inasmuch as both types of cases have some irritability. The thyroid gland itself may be smooth, retain its shape, and not be appreciably noticeable. The basal metabolism test, while valuable, may often reveal little in such cases. as a short rest in bed will quiet the individual and restore normal metabolism. The Goetsch test is not infallible. The best and surest aid is the pulse. In a neurosis, the heart rate will vary day and night, dropping during sleep and increasing in the daytime when the individual may work herself into a state of excitement. The thyroid tachycardia, however, does not change much, being the same at night as in the daytime. Where the case is due to a deficiency of iodine ingestion, the test of giving iodine or thyroid extract may clear up the diagnosis. When the colloid of the thyroid gland begins to degenerate, its smoothness and shapeliness change, for the degeneration often does not take place with regularity. There may develop small adenomatous areas that are noticed and felt as hard lumps. A small toxic gland may be due to infected tonsils or decaying teeth.

The differential diagnosis of incipient tuberculosis from incipient goiter is given by R. Pettit (Endocrinology, May, 1924) as follows: Tuberculosis: Fatigue, lassitude, lack of appetite; weakness, nervousness, fever; rapid pulse, loss of weight, cough, night-sweats, dyspnea. Goiter: Fatigue, lassitude, increased appetite; weakness, nervousness, no fever; rapid pulse, loss of weight, cough, sweating, dyspnea; palpitation, tremor. Certain signs, particularly palpitation, tremor, heart changes, and inappetite—almost always creased present in toxic goiter-readily differentiate early goiter from incipient tuberculosis if a careful history is taken.

PATHOLOGY.—In a paper based on a study of 4000 cases of goiter, A. S. Jackson (Ann. of Surg., June, 1924) proposes the following simplified classification: 1. Colloid. 2. Adc-(a) With hyperthyroidism (toxic adenoma); (b) without hyperthyroidism (simple adenoma). 3. Exophthalmic goiter (Basedow's Graves's disease). These must be distinguished from tuberculosis, malignancy, syphilis, thyroiditis, actinomycosis, etc. The usual text-book classification of goiter is confusing.

The various clinical types of cystic, calcareous and hemorrhagic goiter are merely forms of adenoma. Colloid goiter appears at puberty and is seen in 60 per cent. of girls between the ages of 16 and 20 in the goiter district of the Middle West. Factors in the etiology of colloid goiters are: A deficiency of iodine in the soil and consequently in the drinking water; an excessive demand upon the thyroid gland for thyroxin by the system. Apparently adenomas develop in neglected colloid goiters as a form of compensatory development.

A tabulation of the goiters by E. Gold and V. Orator (Wien. klin. Woch., Apr. 3, 1924) in 555 cases seen in the preceding 21/2 years showed that the incidence of exophthalmic goiter is fairly uniform in adult life, while the parenchymatous goiters are found in childhood up to the 17th year. During maturity, eutrophic colloid goiters are predominant, and in advanced age atrophic colloid goiters are found. The nodular goiter or adenoma appears with slowly increasing frequency from the 2d decade on, exceeding other forms of goiter after about the 40th year of life. The juvenile goiter is predominantly a parenchymatous hyperplasia.

The authors conclude that the goiter of adolescents does not represent a stationary stage or a regression to a previous stage of development, but is a pathological hyperplasia of the parenchyma. The findings reported indicate that, besides endogenous factors, lack of iodine is an important cause of juvenile goiter.

Jour., July, 1924) asserts that the 4 forms of goiter—cystic, simple adenomatous (with or without degeneration), toxic adenomatous, and exophthalmic—all have a common ori-

E. H. Ochsner (Neb. State Med.

resistance of the individual and the severity or nature of the toxins and irritants acting. The principal causes are focal infections, colon bacillus infections of the gastro-intestinal tract from drinking contaminated water over a long period, and meat intolerance, either acquired or congenital; the 1st is the least potent cause. E. G. Blair (Endocrinol., May, 1924) also holds that all goiters begin colloid goiters. Proliferative forms are hyperplastic and therefore accompanied by at least some hyperthyroidism.

PROPHYLAXIS.—E. Coulaud (Rev. d'hygiène; cited by Jour. Amer. Med. Assoc., Mar. 28, 1925) has published an excellent review of the present status of the problem of endemic goiter. As far back as 1852, the researches of Chatin established an unquestionable relationship between the iodine content of the water and the food, on the one hand, and the incidence of goiter and cretinism. His findings were afterward confirmed by numerous authors.

The causative agent of goiter behaves, in some respects, like a microbe. Boiling of the drinking water reduces its goitrigenous effect. Repin and Bircher held that goiter is due to a colloidal substance contained in the water; McCarrison believes in its infectious origin, long advocated by European workers. The infective theory of goiter has been supported particularly by Galli-Valerio and Messerli, who suggest an infection by way of the digestive tract (ingestion of impure water). Numerous germs participate in this water-borne infection; Messerli thinks that the transmission of these germs may take place through direct contact. The germ theory, however, fails to explain hereditary goiters. But if we accept with Repin a chemical origin for goiter, a hereditary goitrous influence could be more readily understood.

Yet, Chatin's theory of iodine insufficiency has given rise to the prophylaxis of goiter, the good effects of iodine treatment, first recommended by Coindet at the beginning of the 19th century, having been confirmed. Trials of iodine prophylaxis were made in France toward the middle of the last century; later, in Austria and in Italy. The method, however, was abandoned, the heavy doses employed having resulted in numerous accidents (0.1 to 0.15 Gm.—11/2 to 21/4 grains—of iodine per kilogram— 21/5 pounds—of table salt used in food). It is only during recent years that, under the influence of Swiss physicians, notably Hunziker and Bayard, the prophylaxis of goiter has been established on a more secure basis.

The first attempts were in school children, who were given every week a little less than 0.001 Gm. (1/65 grain) of sodium iodide, or approximately Gm.  $(\frac{2}{3}$  grain) annually. Marine and Kimball then employed doses 10 times as strong. But the doses employed in Switzerland, though very small, were found to be sufficient to insure prophylaxis. This was extended to wet nurses and to mothers from the beginning of pregnancy, using iodized sea salt, as was done in France the middle of the last century. Fellenberg, in Switzerland, found experimentally that infinitesimal doses of iodine were sufficient to insure prophylaxis. In the iodized table salt furnished in Switzerland, the potassium iodide is equal to 0.005 Gm. ( $\frac{1}{12}$  grain) per kilogram of salt.

The opponents of iodized salt emphasize that its use offers: 1. The danger of exophthalmic goiter, a fact incontestably proved. This disease has been frequently caused in Switzerland by self-treatment among goitrous persons who took large doses without supervision. 2. Iodine exerts a harmful effect on the genitalia, as shown experimentally, but the prophylactic dose of iodine is too small to justify any fears on this score. 3. Iodine prophylaxis might, in combating goiter, favor the extension of tuberculosis. Goitrous persons seem to resist tuberculosis infection (Cassan, Hamburger, Betz), but Couland found that animals in which thyroid deficiency had been caused by the Röntgen rays were especially resistant to tuberculous infection. Animals which were not treated but were the offspring of hypothyroid parents likewise show a decreased susceptibility to tuberculous infection.

On the whole, the prevailing view is that of O. P. Kimball (Jour. Mich. State Med. Soc., Sept., 1923), who holds that the thyroid gland has an extraordinary affinity for iodine, the amount taken up by any given thyroid varying with the degree of active hyperplasia. The average normal iodine content is about 2 mgm. per gram of the dried gland, and the maximum total store in a strictly normal human thyroid does not exceed 25 mgm. The administration of 5 or 10 mgm. ( $\frac{1}{12}$  to  $\frac{1}{6}$  grain) once a week throughout the school year, under supervision of the school nurse, is regarded by him as the most practical method of goiter prevention both in boys and girls. Prevention of goiter during pregnancy is as important as during adolescence, and should be part of the routine care of every expectant mother; 10 to 20 mgm. (1/6 to 1/3 grain) of iodine per week throughout the entire term is sufficient.

TREATMENT.—The rather reckless use of iodine has been condemned by various authors. editorial writer in Northwest Medicine for August, 1924, states that while the enthusiasm of the medical profession in accepting a new procedure in therapy is commendable in the highest degree, 2 sources of error may be discerned in the adoption of iodine therapy in goiter, viz., overenthusiasm and inaccurate knowledge, both leading to its use when not indicated and to misapplication. Plummer showed the exact indications for iodine, namely, in exophthalmic goiter, especially if there be a gastrointestinal or mental crisis. Its use as a universal prophylactic by iodinizing the drinking-water of an entire population is based upon unscientific grounds. First, it is questionable whether iodine can be added in sufficient quantities to be of prophylactic value and at the same time be economically sound; second, the plan does not take into consideration the harm it may do in 2 directions: (a) It may in a large population activate or render toxic many cases of adenoma until then innocent; (b) possible gastroenterologic phenomena that might be induced in a population daily dosed with iodine, however small the amount. It is quite a different matter to give an entire population iodine every day and to give

school children a small dose once a week or for 10 days twice a year. Another overenthusiastic application occurs in giving it in all forms of toxic goiter.

Plummer has distinctly warned against the use of iodine in toxic adenoma.

According to Bircher (Zent. f. Chir., Nov. 1, 1924), toxic manifestations due to iodine preparations used for goiter have increased to an alarming extent, many such cases being unrecognized and untreated. He deems it unethical to be silent in regard to the dangers associated with such general and more or less uncontrolled medication. O. Roth (Schweiz. med. Woch., Sept. 13, 1923) also warns against the abuse of iodine in Switzerland, where every school-teacher and druggist seems to give it freely, apparently convinced that the officially sanctioned dosage is without danger. Out of his 30 cases of bad effects of iodine he publishes a few in which the injury was done by minimal doses. Very strict individualization is essential in the prophylactic treatment. who have tolerated larger amounts before, may later develop hyperthyroidism after taking even very small doses.

Jagic and Spengler (Wien. klin. Woch., Jan. 31, 1924) likewise state, on the basis of 57 cases, that the dangers of iodine medication are often underestimated. Existing cardiovascular symptoms were aggravated, and often tachycardia and hyperkinesis appeared during treatment, followed by decrease of vision and severer symptoms. Of 5 cases of hyperthyroidism, 2 were improved, while 2 were first improved but showed increase of symptoms after a few weeks, necessitating operation. Diffuse goiter reacted better to iodine than nodular goiter.

As Bram (Therap. Gaz., May, 1924) states, the etiology of sporadic simple goiter is based upon excessive demands for thyroid hormone away from the thyroid, and upon efforts at physiologic adjustment by the organ which is incapable of supplying this excess. Since heredity is an important factor, prophylaxis must begin before birth, by care of the pregnant mother. The child goitrous parents should be guarded against excessive physical and mental strain during school life, and at puberty special care should be exercised. The continuation during menstruation in young girls of the usual physical and mental duties is the cause of a large percentage of sporadic simple goiters. Goiter resulting from infections is usually well developed before the case appears for treatment. Infectious foci, dietetic, hygienic, and other etiologic factors must be sought for and corrected. Iodine (not thyroid extract) may be employed with advantage in endemic simple goiter, and thyroid extract (not iodine) in the sporadic type. Electricity is at best an adjuvant. The treatment of puberty hyperplasia of the thyroid consists primarily of prophylaxis against the onset of exophthalmic goiter, and secondarily. of rational measures to reduce the thyroid to normal structure and function; here also, iodine is of questionable service, and thyroid extract is contraindicated. Treatment should be attempted along the same lines as in exophthalmic goiter (q.v.).

Two cases which demonstrate the dangers and value of iodine treatment have been published by F. Hamburger (Münch. med. Woch., Dec. 26, 1924). In an infant 4 days old that could hardly breathe on

account of a goiter, he gave 1 mgm. (1/65 grain) of sodium iodide daily for 8 days. The goiter was distinctly smaller on the 4th day, and had disappeared by the 8th day. Mucous diarrhea set in, however, the baby lost weight, and died on the 11th day. This shows that the medication should be discontinued as soon as the goiter begins to decrease in size. Another infant, 8 months old, recovered within 1 week after having received only 0.3 mgm. (1/200 grain) of potassium iodide and 0.015 Gm. (1/4 grain) of thyroid gland.

Kaspar (Wien. klin. Woch., July 17, 1924) had excellent results in parenchymatous goiters, especially in children, with minute doses of **potassium iodide**, *i.e.*, 1 to 4 mgm. ( $\frac{1}{65}$  to  $\frac{1}{16}$  grain) per month, divided in daily doses. These amounts are too small to produce thyrotoxic symptoms.

Of the girls attending Indiana University, 32.8 per cent. were found by F. H. Luck (Ind. State Med. Assoc. Jour., June, 1924) to have goiter. The treatment consisted of a preparation containing 6 mgm. (1/10 grain) of iodine in organic combination with fatty acids. The results were as follows: Improved, 61.5 per cent.; stationary, 25 per cent.; increased, 14.5 per cent.

As enlargement of the thyroid is due to an insufficiency of the gland, iodine is administered to stimulate it to increased activity. But, according to Klein (Budapesti orv. ujság., Aug. 23, 1923), experience has shown that thyroid substance containing iodine is more effective than iodine salts, though only in purely hypertrophic cases. In true growth cases, nodules, cysts and connective tissue hypertrophies, iodine therapy is useless. It must always be begun carefully in order not to excite symptoms of Graves's disease. Even in goiter, when the basal metabolism test cannot be resorted to, tolerance should be first tested with a small dose daily and if possible the patient should be sent to a goiter-free region, or the drinking water should be changed or perhaps replaced by mineral water containing iodine. The small doses are used for 2 or 3 weeks. If no symptoms of hyperthyroidism occur, such as tachycardia, fatigue, dizziness, etc., the dosage is increased. Of 170 cases, 80 per cent. were completely cured in several weeks or months. Patients 12 to 16 years old reacted best. Iodine was given in the form of 5 to 15 drops in a 1/2 glass of milk once or twice a day, but was less effective, even in cases where thyroid tablets given later were successful. The action of iodine ointments is insufficient and they readily produce adhesions; still more so do the X-rays, which are often effective. Quartz light seems to be ineffective. Where internal treatment fails (20 to 30 per cent. of cases), or in fibrous cystic forms, operation must be performed. Respiratory disturbances are caused chiefly by substernal goiters.

The use of intestinal antiseptics seems to be growing in favor. As stated by McCarrison (Brit. Med. Jour., Aug. 2, 1924), differences of opinion exist in regard to the intestinal antiseptic action of various drugs in early cases of simple goiter. In India, where he had to deal solely with epidemic goiter, such intestinal antiseptic drugs as thymol, betanaphthol and salol caused diminution in size or disappearance of a proportion of recent cases of goiter when regularly administered over periods of several weeks. Messerli had also

studied the effects on "soft goiters" of the same drugs, and also of creo-His observations were controlled and carried out under experimental conditions. As had McCarrison, he had concluded that "continued disinfection of the intestine determines a gradual diminution in size of soft goiters." This has been confirmed by other Continental observers, principally as to the beneficial action of benzonaphthol in recent cases of endemic goiter. D. J. Harries (Brit. Med. Jour., May 12, 1923) obtains such good results with the intestinal antiseptic kerol that he no longer gives iodine.

Coulaud (Ann. de méd., Dec., 1923) had good results in 94 out of 100 cases of goiter in women with ovarian gland, giving the powder continually for 3 months, by mouth, then reducing the dose.

Local treatment is advocated by E. H. Ochsner (Neb. State Med. Jour., July, 1924), who employs the method first recommended by the late Gunn. Moses Preliminary causes are first determined and eliminated. The positive treatment consists of weekly injections of 5 per cent. aqueous solution of phenol directly into the enlarged thyroid with a 1 c.c. Luer syringe and a 22 gauge needle about 11/4 inches long. The technic must be strictly aseptic. The dose is 1 c.c., increased by 1 c.c. at each injection, up to 6 c.c. in extreme cases. The patient is directed to swallow, so that the thyroid may be definitely located, whereupon the needle is plunged into it. The patient is again directed to swallow, and after an interval to make sure that the needle has not punctured a large vessel, the sterile carbolic solu-

tion is injected. Care must be taken to avoid (1) infection, (2) injection into large vessels, (3) striking the recurrent laryngeal, and (4) puncture of the trachea. The last 2 are prone to occur towards the end, when the thyroid has become small. Contraindications are tumors, malignant and benign, calcifications and cal-. careous cysts, and impending strangulation of the patient. By this method 98 per cent. of cases of the above 4 types of goiter can be cured without operation. The author has injected 182 patients without a death and with only 4 failures—2 patients with calcareous cysts, and 2 with exophthalmic goiter, who preferred operation after the first few injections. Seven patients successfully treated had been previously operated on.

# GOITER, TOXIC, OR HY-PERTHYROIDISM; GRAVES'S DISEASE.—DIAGNOSIS.—O. P.

Kimball (Ohio State Med. Jour., July, 1924) studied 84 cases in which the diagnosis was difficult and the method and results of treatment in consequence uncertain. Of the total, 24 were found extremely sensitive to iodine, daily doses of 10 mgm. (1/6 grain) intensifying every symptom of hyperthyroidism and increasing the basal metabolic rate. Of 60 cases in which the functional test was negative, operation was performed in 19. The postoperative course in this group presented a marked contrast to that of the patients who were sensitive to iodine. In none was thyroidectomy followed by a definitely satisfactory result.

In 138 observations on thyroid cases, H. W. Davies and J. Eason (Quart. Jour. of Med., Oct., 1924)

found that increase of pulse pressure is characteristic of hyperthyroidism. Diminution of pulse pressure is characteristic of uncomplicated hypothyroidism. Pulse pressure and basal metabolic rate, therefore, vary in the same direction. Analysis of the findings in the 150 observations on pulse pressure and basal metabolic rate showed a considerable degree of correlation between these 2 phenomena in cases of normal and disordered thyroid function.

R. E. Hamilton (Jour. Amer. Med. Assoc., Aug. 9, 1924), studying the hearts in all cases of suspected thyroid disease in Lahey's clinic in the preceding years, found no significant heart changes attributable to thyroid disease either in doubtfully toxic or in definitely non-toxic cases. dividual cases may show cardiac changes of various kinds, but this is to be expected in any large group of adults with an average age close to 40 years. In the definitely toxic cases significant heart changes were found in about 35 per cent. The first significant change is auricular fibrilla-This is at first transient, but tends to become established if the hyperthyroidism remains unchecked. If the hyperthyroidism is relieved during the stage of transient attacks, the condition permanently disappears in nearly every case. Similarly, in many patients in the clinical stage of established auricular fibrillation. normal rhythm returns permanently. In 900 cases of thyroid disease with some degree of toxicity the author found 50 with signs of true congestive heart failure due to hyperthyroidism. With very few exceptions, the histories of these 50 cases showed predominance of symptoms referable

to the heart from early in the course of the disease. This agrees with the clinically recognized selective action of hyperthyroidism for certain hearts. Many of these cases are diagnosed and treated for a long period as cardiac cases, the underlying hyperthyroidism being overlooked.

E. Enroth (Finska Läk. Handl., Dec., 1924) urges the importance of cdema of the upper eyelids as one of the earliest manifestations of toxic hyperthyroidism. He noted it in 4 cases.

Among the factors which may assist in the diagnosis of syphilitic exophthalmic goiter, E. Schulmann (Med. Jour. and Rec., Sept. 17, 1924) cites (1) response to antiluetic treatment; (2) the Wassermann reaction; (3) presence of the various stigmata of hereditary syphilis in the patient's antecedents, and (4) association with the goiter of maladies known to be of syphilitic origin.

ETIOLOGY.—Apart from the fact that various authors urge anew the importance of focal infections, dental, tonsillar, intestinal, etc., in the causation of toxic goiter as a preliminary to successful treatment, very little has been contributed to our knowledge of the etiology of toxic goiter. Koopman (Belgian Corresp. to Jour. Amer. Med. Assoc., Dec. 20, 1924) has reported 2 cases of exophthalmic goiter in husband and wife, due probably to contagion. The Wassermann test was positive in both patients. Syphilitic infection may give rise to exophthalmic goiter, and the author cited in this connection 5 analogous cases found in the literature.

In a letter to the Lancet, March 7, 1925, Llewellyn emphasizes the im-

portant relationship between rheumatism and goiter. The periods of increased incidence of rheumatism and goiter synchronize markedly with puberty, the child-bearing decades, and the menopause-viz., with those physiological processes (menstruation, pregnancy, lactation) which determine oft-recurring or enduring hyperemia of the thyroid. The increased incidence of osteoarthritis in females at the menopause is doubtless dependent on the senile atrophy of the thyroid incidental to this epoch. Clinically speaking, the association between "rheumatism" and thyroid deficiency is intimate. The "rheumatic" child often shows minor signs of hypothyroidism. rheumatic fever is often followed by a state of hypothyroidism. He has noted the following peculiarities suggestive of a link with goiter: (1) In regions where goiter is endemic, the incidence not only of rheumatic fever and cardiac rheumatism, but also of rheumatoid arthritis, appears to be abnormally high. (2) If rheumatic fever develops in the child of a goitrous mother, it shows a strong impetus to chronicity, being rebellious to salicylates. Also, if it occurs in the child of a mother not necessarily goitrous, but resident in a region where goiter is endemic, it may show the same peculiarities. (3) This obduracy to salicylates relents if thyroid be superadded, the thyroid seeming to activate the otherwise impotent salicylates. As to rheumatoid arthritis and osteoarthritis, their association with hypothyroidism and often with goiter is well established. The favorable response of these disturbances to thyroid therapy is likewise generally realized.

TREATMENT.—The iodine treatment has continued in what might be termed its reckless vogue. In 1920, Neisser reported very favorable results from the administration of small doses of iodine, and since then it has been advocated by Loewy and Zondek, in Germany, and various clinicians in this country.

Plummer (Trans. Assoc. Amer. Phys.; Jour. Amer. Med. Assoc., May 24, 1924) resorts to iodine therapy on the basis of the following hypothesis: Exophthalmic goiter is due excessive stimulation of the Iodine treatment does not thyroid. act when the thyroid secretion itself is normal, and even compound solution of iodine will show no effect. Stimulation of the gland will change the picture and the above solution will do so. Even toxic adenoma cases gave good results. Digitalis is deemed dangerous and should be avoided. When there is generalized edema and broken compensation, he gives iodine. It has a marked influence on the latent infection.

According to A. Lambert (*Ibid.*), iodine therapy is not a new step, though a good one. Enlargement of the thyroid is a sign of lack of equilibrium of the endocrin metabolism; this results in disturbance of thyroid secretion. This was noticed particularly during the emotional strain and excessive physical fatigue of the war period. The thyroid enlarges in the effort to restore physical equilibrium. A large, soft, fresh enlargement is produced by physical overexertion. Such patients respond to thyroid therapy.

The method is fraught with danger. According to H. A. Christian (*Ibid.*), a great deal of damage will

be done with iodine in thyroid cases if we get too enthusiastic. His results in the Massachusetts General and Peter Bent Brigham Hospitals showed that iodine is very valuable as a preparation for operation because it controls the situation temporarily in certain cases. The control is limited, and continuation of treatment in a large percentage of cases seems to result in complete loss of benefit from the iodine. If it is discontinued after a considerable period of time, there is a marked increase in symptoms to a point which is much more marked than that which existed prior to the iodine therapy, and, consequently, there is considerable danger in connection with operations after long use of iodine. Another source of trouble is that the patient is apt to go home and continue iodine at home. Mason's method of treatment may prevent trouble, but we should recognize that there is still a lot we do not know about the thyroid in relation to iodine and as clinicians we may cause harm in the course of acquiring knowledge.

According to E. H. Mason (Trans. Assoc. Amer. Phys.; Jour. Amer. Med. Assoc., May 24, 1924), some cases of exophthalmic goiter lose the toxic state after iodine, and metabolism reaches a normal level in a week. The exophthalmos recedes and the thyroid gland becomes smaller. The thyroid in such cases cannot completely iodize the molecule, and this is the cause of the toxicity. Iodine enables the gland to manufacture the normal product. Exophthalmic goiter, then, may be classed as a dysthyroidism. In atypical cases, with moderate exophthalmos, the toxicity does not completely disappear with iodine treatment. This is a mixed type-partly dysthyroidism and partly hyperthyroidism. The latter condition persists in spite of iodine therapy. Hyperthyroidism itself is corrected by thyroidectomy. The cases of dysthyroidism with hyperthyroidism are very difficult to treat.

A. S. Jackson (Ann. of Surg., June, 1924) concludes after a study of 4000 cases, that the popular interest which has been aroused in the treatment of goiter by iodine has greatly increased the number of cases of *iodine hyperthyroidism*. Iodine is a specific in the prevention and cure of colloid goiter, provided no adenomas are present. If there is doubt as to the presence of adenoma, it should not be given.

Jagic and G. Spengler (Wien. klin. Woch., Jan. 31, 1924) used 3 or more drops of a 5 per cent. solution of sodium iodide 3 times a day in simple goiter. Of 16 patients with thyrotoxic symptoms, 8 were ameliorated, while 2 became worse. Larger doses were used in 36 cases of simple goiter; 12 patients improved. The treatment had to be discontinued in 7 because of toxic symptoms. Tolerance is entirely individual and cannot be ascertained in advance. Tachycardia is a very important symptom. The treatment is far from safe if not kept under close control.

According to Sajous (Jour. Amer. Med. Assoc., Nov. 8, 1924), iodine should not be used when the basal metabolism is above normal, *i.e.*, in true hyperthyroidism. He cites a case in which iodine given by the family physician caused the basal metabolism to rise 5.5 per cent. per week, with toxic symptoms steadily developing. In another instance, the patient was about to be given iodine when a precautionary basal metabolism test showed + 54. The cause of the overactivity of the thyroid is as a rule a focal infection, which should

be eliminated to cure the case; iodine is active only insofar as it activates for a time the defensive function. He is in accord with Bram (Therap. Gaz., May, 1924) to the effect that individualization is the basis upon which successful treatment depends. A most painstaking physical examination, with the necessary laboratory analyses, is required. The diet should be ample, but exclude flesh, stimulants and irritants.

Starr, Walcott, Segall, and Means (Arch. of Int. Med., Sept., 1924) found that in most cases of exophthalmic goiter administration of iodine by mouth caused a remission as rapid and as extensive as that following subtotal thyroidectomy, but that it was not sufficient to suppress the disease permanently. After such a patient has been taking iodine for a while, a rapid rise in the metabolic rate and an increase in the toxic symptoms occurred within 1 to 2 weeks.

Liebesny (Wien. klin. Woch., Aug. 7, 1924) combines small doses of potassium iodide (1½ to 3 mgm.—½0 to ½0 grain—daily) with thymus gland, preferably from young animals. He had good results in hyperthyroidism. The iodine was much better borne. Cowell and Mellanby (Quart. Jour. of Med., Oct., 1924) recommend potassium iodide as an adjunct to the medical treatment of hyperthyroidism and to prepare patients for operation. None of their cases were very severe, and they regard the treatment in no sense curative. The severe cases will probably continue to require operation.

Benhamon (Paris méd., Mar. 10, 1923) found quinidine sulphate of signal advantage in a severe case of tachyarrhythmia due to toxic goiter, digitalis having proved useless. The dose given on the first day was 0.6

Gm. (10 grains). Improvement instantly followed; by the 2d day the pulse had fallen to 80 and was more regular. The same dosage was continued. When it was reduced to 0.4 Gm. (6 grains), the pulse-rate began again to rise. After 8 days the supply of quinidine ran out, and for the next 3 days there were 2 attacks of tachy-Resumption of the drug promptly restored the former rhythm. After 25 days it was necessary to give quinidine only every 2d or 3d day. The patient was able to return to her occupation, and what was still more remarkable than her cardiovascular recovery was the almost complete disappearance of the goiter; it was even smaller than it had been before the menopause.

On the basis of 1015 cases of hyperthyroidism, Marañon (Revue de méd., xli, 248, 1924) urges that it is essentially a medical affection. The only 2 indications for surgical treatment are symptoms of compression and the failure of careful, persevering medical treatment. General hygiene, diet, and physical and mental rest are essential. The history should be studied to discover and eliminate possible factors causing or aggravating thyroid hyperfunction, which may be of a psychic or of an infectious type. He uses mainly an ovarian extract (with ovarian insufficiency); quinine, in young patients with extensive vasomotor instability; and belladonna, where there is disturbance of the sympathetic nervous system. If medical treatment fails, radiotherapy should be tried before surgical treatment. The X-rays are most successful in simple and acute cases of hyperthyroidism, especially in patients with confidence in the After using antithyroid treatment. serum in 815 cases, he concludes that its effect is solely psychic.

S. Shapiro (Endocrinol., Sept., 1924) tried in 4 cases a 50 per cent. glycerol emulsion of fresh ox interrenal glands from which practically all the epinephrin tissue had been removed. The average dose was 30 c.c. daily. There was a rapid gain in body weight and improvement in muscle strength, associated in the asthenic patients with hypotension with a progressive rise in blood-pressure to about the normal level, where it remained. There occurred also a temporary rise in heat production, which persisted as long as 3 months after medication was stopped without any fall in weight. Another effect, a source of great relief to the patient, was the influence on abnormal menstruation. Diarrhea usually disappeared with the general improvement.

R. D. Lawrence (Brit. Med. Jour., Oct. 25, 1924), in 4 severe cases of exophthalmic goiter, tried large doses of insulin, 60 to 100 units a day. It was well borne. Two patients were greatly improved, one being practically normal on discharge from the hospital. In both the disease was uncomplicated and of less than a year's duration. The 2 others were not essentially benefited, although 1 gained much in weight and felt better.

Nuvoli and La Banca (Policlin., Med. Sect., Dec. 1, 1924) recommend diathermy of the neck. The tachycardia is especially well influenced. They attribute the effects to a direct action on the thyroid.

Before using **X-rays** in hyperthyroidism, Pfahler (Amer. Jour. of Electrother. and Radiol., June, 1924) establishes the diagnosis by means of the basal metabolism test, the quinine-hydrobromide test, the Goetsch test, and a careful study of the tachycardia. The rays require 6 to 12 months to produce satisfactory results, although improvement is usually recognized at the end of a month. The results are decrease of pulse followed by increase of weight.

Thyroid enlargement is one of the last signs to disappear and exophthalmos may not disappear completely until some time after the treatments. Success is expected in  $\frac{2}{3}$  of all cases. The author uses filtered rays just short of an erythema dose 3 times at intervals of 4 weeks. The intervals are gradually lengthened to every 6 to 8 weeks as the symptoms approach normal, 8 to 10 treatments in all being given.

In the use of the X-rays, L. G. Cole (Atlantic Med. Jour., May, 1923) favors smaller doses than have been used in the past, on account of the possibility of injury to the parathyroids and recurrent laryngeal nerves. Tetany may result after ligation of the inferior thyroid arteries. Calcium for the tetany is then indicated [with parathyroid, ½0 grain—0.006 Gm.—Ed.]

W. S. Newcomet (Ibid.) obtained relief of symptoms by the X-ray when operation failed. He recommends radium for very irritable cases. In selected cases radiation may be tried before operation. A. E. Roussel (Ibid.) emphasizes the importance of basal metabolism tests before resorting to the roentgenologist. If the metabolic rate is high, the radiation should be preceded by test in bed and dietary treatment. D. Guthrie (Ibid.) points to the hyperemic skin of exophthalmic goiter as incapable of standing strong X-ray doses. Only experts should handle these cases.

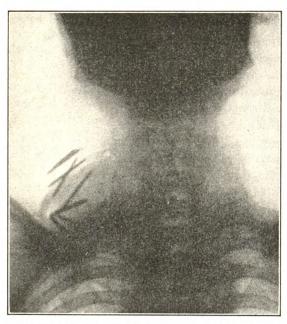
E. P. Richardson and J. H. Means (Arch. of Surg., Sept., 1924) found that cases treated by **X-ray** showed no noteworthy increase in operative difficulty. Ligation of the superior thyroid arteries appears to be slightly more effective in patients having previously had X-ray treatment. The degree of benefit received from hemithyroidectomy was not increased by previous X-ray treatment. The operation itself, although occasionally curative, did not prove desirable. It was followed as a rule by completion of

the operation of subtotal thyroidectomy within a few months. Predisposition to myxedema was not favored by preliminary subtotal thyroidectomy in patients who have undergone X-ray treatment.

RADIUM.—Three different types of thyroid disease are reported by J. O. Bower and J. H. Clark (Amer. Jour. Roentgenol., Nov., 1923) in which large doses of buried radium needles, introduced under local anes-

The primary changes induced by radium in the thyroid were found by the same authors (*Ibid.*, Aug., 1923) to be hemorrhage and necrosis. Organization and healing were evident in the 3d week and complete about the 12th. No changes were demonstrable in the parathyroids. The apparent resistance of the thyroid tissue to radiation suggests that implantation is superior to surface applications.

In a woman of 38 years, observed by Karsis (Gynéc. et obst., Aug., 1924),



Radium needles embedded in left lobe of the thyroid. (Bower and Clark, in  $Amer.\ Jour.\ of\ Roentgenol.)$ 

thesia, were employed. Such doses were well borne and gave no untoward symptoms. Buried radium needles are far superior to the injection of boiling water, quinine and urea, or polar ligation. The method is indicated in cases that are poor operative risks. Owing to the apparent resistance of thyroid tissue to radium rays, as found from experimental work, comparatively large doses of buried element should be employed,

signs of exophthalmic goiter had appeared 5 years before and a uterine fibroma been discovered 3 years later, giving rise to profuse hemorrhages. After 3 intra-uterine applications of radium and a 4th application in the lateral vaginal culs-de-sac, the uterine tumor decreased in size and finally disappeared completely, while at the same time the signs of exophthalmic goiter vanished entirely, although the thyroid was not treated. This confirms the existence of a relation between the genital organs and the thyroid gland.

Hagans (Internat. Jour. of Med. and Surg., Apr., 1924) has used radium in nearly all types of goiter experimentally for 4 years. A change was noticed in 45 per cent. of cases, 35 per cent. being cured, and the rest not benefited. The treatment is indicated where there is excessive thyroid secretion.

SURGICAL TREATMENT. —Analysis of 500 replies to questionnaires in cases of toxic and exophthalmic goiter sent by A. J. Ochsner (Ann. of Surg., Sept., 1924) showed that 25 per cent. of the patients who had subtotal thyroidectomies still suffer to some extent from tachycardia or other form of cardiac disturbance; 1 per cent, had some disturbance of the voice for a time, which has, however, completely disappeared; 1 has voice Recurrence was obdisturbance. served in 7 per cent. Exophthalmos persisted in 9 per cent. Three patients died within 1 year after the operation, and 12 from 2 to 9 years after from other diseases; 1.6 per cent. were worse after the operation.

In Dowd's (*Ibid.*) analyses of 150 operated goiter patients, 103 were able to do the ordinary amount of work; 32 were able to do moderate work, but carefully avoiding over-exertion; 1 showed persistent invalidism; 4 died since leaving the hospital; 5 died in the hospital; 5 could not be traced. Acute hyperplastic thyroids gave the most severe symptoms, but toxic adenomas were sometimes nearly as serious. Adenomas and so-called colloid goiters sometimes gave distressing symptoms from pressure and unsightliness.

The immediate effect of subtotal thyroidectomy in toxic goiter, as observed by Segall and Means (Arch. of Surg., Jan., 1924), is a rise in basal

metabolism and pulse. A progressive fall in metabolism and pulse then brings them within normal limits in from 4 to 12 days. The rate of detoxication following this operation is quite similar to that during the period of recovery from hyperthyroidism induced by thyroid feeding.

F. Liebig (Arch. f. klin. Chir., cxxix, 58, 1924) summarizes the results of 268 operations performed in the Dresden surgical clinic during 30 years. X-rays, used in 11 cases, resulted in 2 deaths and 7 temporary improvements. The author favors local anesthesia for operation, but employed general narcosis frequently; when the latter was used the death rate was 1/3 higher. All of the various operative procedures were employed—from ligation of 1 artery to ligation of all 4 and unilateral or bilateral subtotal resection. Of the 268 cases, 30 (11 per cent.) terminated fatally. Of 39 patients whose present condition is known, 69 per cent. are cured, 17 per cent. have been greatly benefited, 7 per cent. somewhat benefited, and 7 per cent. have received little or no benefit.

Of 18 patients with auricular fibrillation complicating toxic goiter, observed by Dunhill (Brit. Med. Jour., Oct. 4, 1924), 16 had Graves's disease. In toxic adenoma, auricular fibrillation may disappear when the adenoma or adenomatous masses have been removed. In Graves's disease it may disappear temporarily when the vessels are ligated, or when one lobe has been removed. It recurs under stress. When enough of the 2d lobe has been removed, the arrhythmia may disappear spontaneously and permanently, or it may require the administration of some quinidine before this occurs.

G. W. Crile (Intern. Jour. of Med. and Surg., Apr., 1924) outlines his preferred treatment of patients with hyperthyroidism as follows: 1. From the moment the patient is presented at the office he is subjected to a direct personal and environmental control, i.e., every contact with the surgeon, assistants, nurses and attendants, from the moment of his preliminary examination to the beginning of his hospital treatment, is made as free from excitation as is possible. 2. Upon entrance to the hospital, methods for restoration of the exhausted cells are inaugurated, viz., fluids are urged; complete rest is induced by sedatives if required; the myocardium is strengthened by digitalization, and if the condition of the patient demands it, a transfusion of blood is given. 3. The operation is performed in the patient's room and the extent of each stage in it is controlled by the condition of the patient. In practically all cases the operation is divided into 2 stages, and often into 3, viz., ligation of 1 pole, ligation of the other pole, and the thyroidectomy. If, during the surgical procedure, the patient's condition is becoming aggravated, the operation is stopped, the wound packed with gauze, and the patient left until his condition justifies completion of the operation. 4. The anesthetic is always nitrous oxide-oxygen, and the degree of anesthesia is never allowed to pass beyond the stage of analgesia, except momentarily when an especially painful moment is foreseen. 5. The postoperative treatment duplicates the preoperative: Rest, secured by sedatives if necessary; abundant water; control of the heart; transfusion if indicated.

F. König (Deut. med. Woch., Jan. 2, 1925) observed a case of occipital neuralgia developing within 3 weeks after an operation for goiter. It was probably due to injury of the occipitalis minor nerve in the conduction anesthesia. The patient recovered after extirpation of the nerve.

## GONORRHEA. —DIAGNOSIS.

—According to H. Gauss (Colo. Med., Dec., 1924), biochemical reactions form the only absolute basis so far known for differentiating the

gonococcus from the other Gramnegative cocci that resemble it. These reactions should be performed in all cases of medicolegal importance. *Micrococcus catarrhalis* does not ferment any of the known sugars; the gonococcus ferments dextrose only, while the meningococcus ferments dextrose and maltose.

Glingar (Med. Klinik, Aug. 31, 1924) found gonococci quite frequently in the rectum in women, and recommends examination in this locality if the other findings are negative. He introduces a Nélaton catheter about 6 cm. deep into the rectum and injects 50 to 100 c.c. of lukewarm water, which flows back again. The purulent flocules are the usual carriers to be examined.

TREATMENT.—In 50 cases of gonorrheal vulvovaginitis in children H. B. Graham and R. Southby (Med. Jour. of Australia, Aug. 2, 1924) found the following measures the most efficient: 1. Until the discharge has ceased and no gonococci are found in the smear: (a) Irrigation with potassium permanganate solution, 1:8000, daily; (b) swabbing with argyrol in 25 per cent. solution 3 times weekly; (c) powdering the vagina freely; (d) rest in bed. 2. Persistence in the above routine, with the exception of rest in bed, for at least 4 weeks after apparent cure. 3. A period of observation is necessary, so that relapse, if it occurs, may be detected. If this treatment is persevered with, all cases can be cured.

Roucayrol (Jour. d'urol., Dec., 1924) employed diathermy in 14 cases of gonorrheal vesiculitis. In 4 it was the sole treatment, while in 10 it was employed after other methods

had failed. From 4 to 15 exposures were used, all proving successful. Reijnders (Nederl. Tijd. v. Gen., Sept. 27, 1924) used diathermy in 11 cases of acute gonorrheal urcthritis. Two patients were unable to tolerate the heat (between 42 and 44° C.), but the others completed the course and 8 were promptly and completely cured, as also 5 of 7 with chronic gonorrheal urethritis. The failures were all on account of lurking lesions in the posterior urethra, but even these sometimes yielded.

In gonorrheal complications, Pierangeli (Policlin., Dec. 22, 1924) found subcutaneous and intravenous injections of gonococcus vaccine in men equally effective, but the intravenous route was much superior in women with adnexitis. He injects subcutaneously twice, and follows with intravenous injections, increasing rapidly from 25 millions of germs. From 6 to 15 injections were required.

According to A. Tansard (Presse méd., Apr. 12, 1924), combined use of vaccines and milk injections in gonorrhea gives better results than either The vaccine used procedure alone. consists of a mixture in equal parts of antigonococcic vaccine and antistaphylococcic vaccine, either of these containing 1 billion germs per cubic The initial doses are centimeter. 0.25, 0.5, 0.75 and 1 c.c., given subcutaneously in the abdominal wall. The milk, which is effective in removing local congestion and pain, is sterilized and injected intramuscularly in the buttock in doses of 1 to 2 or even 5 c.c., carefully avoiding injection into a vein. Successive series of injections, each beginning with the minimum dose, may be given. The local treatment consists merely of mild irrigations, dilatation for stricture, and hot enemas and ichthyol suppositories for prostatitis. The injections are particularly helpful in epididymitis.

In posterior urethritis, epididymitis and prostatitis, T. Pawlas (Polska gaz. lek., iii, 73, 1924) recommends daily gluteal intramuscular injections of 0.5 to 1 c.c. (8 to 16 minims) of sandalwood oil, repeated for 12 days to 4 weeks. Distinctly favorable effects on the amount, character and duration of the discharge, as well as on diuresis and tenesmus, are produced.

In chronic gonorrhea, A. T. Frost (Jour. Roy. Army Med. Corps, Feb., 1924) witnessed very successful results in some cases from subcutaneous injections of 2 to 7 c.c. (32 to 112 minims) of a solution of acriflavin. The latter was 1st deacidified by adding 3.5 c.c. (56 minims) of normal sodium bicarbonate to 1 Gm. (15 grains) of acriflavin and diluting with distilled water to 20 c.c. minims). Three injections are given as a course, at 5-day intervals.

W. A. Whitman (Jour. Amer. Med. Assoc., June 14, 1924) reports excellent results in 8 out of 10 cases of chronic gonorrhea of long standing, some with complications, from intravenous injections of mercurochrome-220 soluble in doses of 2 to 5 mgm. per kilogram of body-weight, repeated daily or on alternate days up to an average total amount of 9.6 mgm. per kilo. There was abrupt or rapid subsidence of symptoms in all, and 6 were completely cured.

In the abortive treatment of gonorrhea, Carle (Lyon Chir., Aug., 1924) states that the present tendency is to use larger numbers of the polymicrobic vaccines. Autogenous vaccine affords too much delay, the main factor in success being promptness of treatment. Cures obtained by vaccine therapy alone are rare. The patient should apply the local treatment 3 times a day and on retiring, visiting the physician every day. The syringe should hold at least 10 c.c. Copious lavages once or twice a day may aid in prompt cure.

GOUT .- Chauffard and M. Wolf (Presse méd., Dec. 5, 1923) confirmed the former's earlier observation that the blood cholesterol is increased in gout and that it is present in tophi. It is situated in the center of the tophus, while sodium urate is at the periphery. A fibrocellular and giant cell reaction surrounds these substances. The central position of the cholesterol is similar to that in gall-stones and aortic atheroma. Chauffard always found in hypercholesterolemia a tendency to the formation of deposits of the substance. Articular tophi, however, are neither a constant lesion in gout nor its exclusive manifestation. Letulle and M. P. Weil (Ibid., July 9, 1924) believe that the lesions described by them are not the consequence of the precipitation of urate salts within the cartilages, but that, on the contrary, they may perhaps be the cause of this precipitation. These changes in the cartilage, at any rate, appear to be 1 of the primary manifestations of gouty arthropathies and the direct consequence of specific humoral disorders. They also seem to be the probable cause of most of the joint manifestations characteristic of gout.

According to D. R. Black (Jour.

Mo. State Med. Assoc., Sept., 1924), the popular idea that the urine is loaded with uric acid in gout has no basis; in fact, there is a diminished excretion as compared with that of normal individuals. He attempted to produce sodium urate deposits by injecting uric acid in large doses intravenously in the joints of rabbits which had previously received injections of organisms from acute rheumatic cases. Some rabbits developed typical rheumatic joints, but no sodium urate deposits. The experiments were repeated on rabbits with uranium nephritis, with equally poor results. A diagnosis of gout seems warranted, in the absence of proved sodium urate deposits, in a patient who has had 1 or more attacks of acute inflammation with a blood uric acid above 5 mgm. per 100 c.c. The characteristic punched-out areas in the proximal phalanges are suggestive evidence of the disease. The factors predisposing to gout lie bevond the mere metabolism of uric acid.

TREATMENT.—Practically nothing new can be recorded under this heading. Of interest is the observation of Laporte and Rouzaud (Bull. Soc. méd. des hôp., Jan. 25, 1924) that attacks of gout are always accompanied by low viscosity (hydremia). If mineral waters are prescribed in treatment, they will provoke an attack unless the blood viscosity is high. The treatment of an attack should aim to induce inspissation of the blood (dry food, laxatives).

GRANULOMA COCCIDIO-IDES.—R. G. Taylor (Amer. Jour. of Roentgenol., July, 1923) studied 11 cases of this condition, first de-

scribed by Rixford Gilchrist in 1896, and which seems to be more common in California than elsewhere. The available literature indicated that the disease is caused by a specific fungus, but that nothing is known of the natural habitat other than the human body, though some animals are susceptible to inoculation. The primary lesions are usually in the skin or lung. They resemble those of tuberculosis in every way. When the initial lesion is in the skin it closely simulates the more acute forms of tuberculosis and may remain localized for years. Eventually a general infection supervenes which ends fatally. The mode of onset and clinical course are also similar to those of tubercle. It is probably more common than is suspected, and may occur outside of California.

Hammack and Lacey (Cal. and West. Med., May, 1924) describe 23 cases treated in Los Angeles and vicinity. In about 1/4 the infection could be traced to the San Joaquin valley; of the others, one each was attributed to Mexico, Texas, Arizona, and New Mexico, and the remainder to Southern California. The patients comprised 19 males and 4 females, and ranged in age from 2 to 83 years, and included 11 Mexicans and 3 negroes. Farm-workers outnumbered any other occupation. Several cases suggested infection through the respiratory tract. Skin lesions were not common; but subcutaneous abscesses were very common, and bone lesions were present in 21 cases. The bones of the feet and the vertebræ were most often affected-the former always in the ankle region, usually with a history of injury, such as a sprain, followed by swelling, suppuration and sinus formation. The cervical lymphnodes were involved in 2 out of 4 children and in 2 adults. Some lung involvement was revealed by every autopsy, and the lesions were very similar to tuberculosis. A striking feature was the freedom of the

gastrointestinal tract, liver, spleen, and genito-urinary tract from infection. In 1 case a few miliary nodules were found in the kidneys; in another, a small nodule in the cerebral cortex. The bone lesions were markedly destructive. Coccidioides immitis either in pus or tissue was demonstrated in every case. No drug has been found of therapeutic value. In 2 cases, subcutaneous lesions apparently responded to X-ray treatment, which should be tried out. Ten patients died of the disease in 1 to 12 months after the first symptoms, and 1 from another cause. Only 4 have been free from symptoms for 2 years or more, in 3 after amputation of an affected foot.

#### GRANULOMA INGUINALE.

—As stated by H. L. Horwitz (Med. Jour. and Rec., Feb. 20, 1924), the diagnosis of this disease was confused, up to a comparatively recent time, with syphilis, yaws, tuberculosis and epithelioma. The lesion as it appears clinically is distinctive by its chronicity and the light red, shiny mass of granulating tissue that bleeds easily and exudes a thin, light, sanguineous fluid with an almost pathognomonic fetid odor. The margins of the lesions are raised and the center sunken.

Schochet (Surg., Gyn. and Obst., June, 1924) observed a case in Chicago, and states that 66 have been recorded so far in the United States. He urges a careful study of all ulcerations about the genitals for Donovan bodies, especially in cases in which syphilis and tuberculosis can be eliminated.

According to I. M. Gage (Arch. of Derm. and Syph., Mar., 1923), granuloma inguinale is endemic in some states, especially in the extreme Southern States, particularly Louisiana. The cause is probably the organism described by Donovan, possibly a protozoön. The symptoms,

which extend over long periods, vary somewhat in different persons, mostly showing a typical granuloma with serosanguineous discharge. The pathologic picture is that of a sclerosing granuloma. A 1 per cent. solution of tartar emetic administered intravenously seems to be specific, although when the lesions are accessible to surgical excision, this procedure, combined with the tartar emetic, will considerably shorten the curative process.

Diagnostic use of tartar emetic as

a therapeutic test is suggested by W. S. Ehrich (Surg., Gyn. and Obst., Jan., 1925), as it is specific. In the case he reports, 11 intravenous injections of 1 and later 1.5 c.c. (16 to 24 minims) of 1 per cent. tartar emetic solution in the course of a month brought rapid curative results.

A. Randall (Jour. of Urol., June, 1923) tried sodium antimony thioglycollate and triamide of antimony thioglycollic acid, made about 12 years ago by J. J. Abel, with excellent results. No toxic effects were noted. [See also Antimony, this Volume].

# H

HAY FEVER (HYPERES-THETIC RHINITIS).—ETIO-LOGY AND PATHOLOGY.— Scheppegrell (Med. Jour. and Rec., Feb. 20, 1924) used the aëroplane to test hay fever pollen density in the air. He found that during the pollinating season of grasses, ragweeds and other common hay fever plants, their pollen occurs in large numbers up to an altitude of 4000 feet, and in diminished numbers at 4000 to 6000 feet. From there up to 15,000 feet the pollens are relatively few. Unless precipitated by rain or descending air currents, pollen clouds remain in the air during the whole pollinating season of the plants which generate them, the fallen pollen being replaced by new pollen. The existence of these pollen clouds and their change of position due to air currents explain, according to the writer, the increase of hay fever pollen during cold winds and after

The blood chemistry was studied by Ramirez, St. George and Moses (Jour. of Lab. and Clin. Med., Dec., 1924). Non-protein nitrogen, sugar and plasma chlorides were determined in 40 cases before and after treatment. In asthma, urticaria, hay fever, etc., there is a relatively high plasma chloride content of the blood and to a less extent of the sugar and non-protein nitrogen. Treatment caused a change in the chemical constituents of the blood, tending toward diminution.

Joachimovitz (Zent. f. Gyn., Oct. 25, 1924) observed menstrual disturbances in 2 of 5 cases of hay fever. In 1 of these leucorrhea seemed to occur in lieu of the nasal hydrorrhea.

TREATMENT.—Nothing essential has been contributed of late, although a few suggestive observations have been recorded which may bear fruit when given the benefit of additional trials. R. J. Payne (Mo. State Med. Assoc. Jour., Aug., 1924) employed alcohol injections into the nasal ganglion in 43 hay fever cases, with results varying from an amelioration such as to cause the in-

dividual to suffer but little discomfort, to complete relief. In only 3 cases was there complete failure.

F. J. Novak, Jr., and A. R. Hollender (Jour. Amer. Med. Assoc., Dec. 15, 1923) conclude that the thyroid gland (or parathyroid) plays an important part in (1) stimulating the calcium of the body or in (2) activating the artificial calcium and fixing it so that it is not immediately excreted. They used both local and general measures at the same time, however, and therefore could not ascertain to which one to ascribe the good results obtained in some cases. R. Sonnenschein and S. J. Pearlman (Ibid., Dec. 20, 1924), from a study of various measures, concluded that the ultraviolet rays may be beneficial, though further trials are needed to prove this point conclusively. Calcium intravenously probably acts as a sedative, giving temporary relief in many cases; its action when given by mouth was undetermined. There is little evidence that in man, at least, parathyroid feeding is of any They were led to doubt value. whether thyroid gland has any value in hyperesthetic rhinitis even when used as an adjuvant to calcium or parathyroid.

A general review of the available measures was published by Bernton (Jour. Amer. Med. Assoc., May 5, 1923). Accurate diagnosis and the administration of potent extracts of pollen protein are the essentials in the prophylactic treatment. The upper air passages of sensitive persons merit the attention of the specialist. Surgical measures should be employed for the purpose of removing mechanical obstruction or to correct deformity.

Bacterial vaccines have from time to time been resorted to. Vaccine therapy in chronic disorders is based on the assumption that the bacteria responsible have become immune to the tissues of the host. As the result of retarded growth, little bacterial substance is liberated to stimulate the production of immune Therefore, vaccines supbodies. posedly supply the deficiency. It is difficult to reconcile this view with conditions which obtain in uncomplicated hay fever. This disease, according to the preponderance of evidence, is an expression of protein intoxication. The rôle which bacteria play is seemingly unimportant. The sneezing and constant rhinorrhea tend to dislodge them and wash away their toxins. Self-purification becomes the first stage of selfpreservation.

Active immunization offers more chance for cure and relief than any other measure. Temporary removal to localities where the offending plant does not flourish is possible for a limited number. Those obliged to remain at home may, nevertheless, derive comfort through simple hygienic measures. Wearing ambercolored glasses and driving in closed automobiles may make trips outdoors more inviting. Women will not hesitate to wear veils and combine fashion with comfort. Flowers and dusts of all kinds must be Bedroom windows, kept avoided. closed during the day, will prevent the ingress of pollen. During sleeping hours, a screen of muslin, saturated with water, may be placed in front of open windows to admit fresh Vigorous exercise outdoors should be avoided, causing a larger

amount of pollen to be inhaled. Frequent washing of the hair is advised as a means of removing the pollen grains which may have become enmeshed in it. Avoidance of sudden change in temperature and of exposure to drafts is of especial importance. Exposure in undressing or getting out of bed will cause a

a consequent paroxysm of sneezing. For the same reason, sensitive persons should guard against ex-

temporary cooling of the surface and

posure to electric fans.

While it has seemed to be the consensus of opinion that co-seasonal or specific pollen treatment during the season of fall hay fever is of little or no value, G. T. Brown (Ann. of Clin. Med., Jan., 1925) reports extremely gratifying results from a modified procedure, in which the interval between the pollen injections is dependent upon the relief obtained, and is frequently lengthened as the dose given increases. The patient returns the next day if any injection fails to benefit, and is given a larger dose; otherwise, he returns only when the benefit begins to wear off. Thus, in 1 case 0.1 c.c. of a 1:10,000 dilution of pollen vaccine was 1st given, next day 0.2 c.c., 2 days later 0.3 c.c., and 6 days later 0.2 c.c. of 1:5000, with improvement after each injection and early disappearance of the hay fever. Five other illustrative cases are given. The initial dose is the largest that fails to cause any skin reaction.

### HEADACHE. —DIAGNOSIS.—

The importance in general medicine of headaches originating from eye, ear, nose and throat diseases is urged by F. R. Spencer (Colo. Med., July, 1923).

Those of ocular origin usually appear after using the eyes for near work. The pain is often dull, but may become sharp or lancinating if the work is continued. It is usually located in the frontal, temporal and particularly in the occipital region. Neuralgic pain in the course of any or all 3 branches of the 5th nerve is due in most cases to a deep-seated lesion and not a neuritis or neuralgia of this nerve alone. Neuralgic pain from the sphenopalatine ganglion, according to Sluder, usually begins in or about the eye on the affected side and then radiates to the ear and mastoid, usually becoming most severe at a point about 5 cm. posterior to the mastoid process. It may and frequently does radiate down the side of the neck or even into the shoulder, arm and hand. Pain from sinus disease is subject to many misleading localizations. A history of nasal and postnasal discharge, either from 1 or both sides, with repeated head colds and a varnished or glazed posterior pharyngeal wall, may all help in deciding whether or not sinus disease is a possible factor. This is especially true in the chronic cases with or without acute exacerbations.

Acute suppurative otitis media, or an acute middle ear abscess, is almost certain to produce pain in the ear, but this pain, while dull at 1st, will radiate to the surrounding portions of the temporal bone after it has lasted for a few hours and has become severe and sharp. An upper back tooth is more apt to produce otalgia than a lower back tooth. Incisors and canine teeth are less frequently productive of otalgia than bicuspids and molars.

Berrisford (Minn. Med., May, 1924) states that a disorder not infrequently mistaken for headache of ocular origin is the so-called "vacuum" headache, a condition first pointed out by Sluder and Ewing. This malady is described by Sluder as "a lowgrade, unending headache" brought about through the closure of the frontal sinus without nasal symptoms or signs (e.g., obstruction of secretion) and made worse by use of the eyes. The pain is due to a partial absorption of the air in the sinus, with a resulting negative pressure which renders the walls sensitive. The headache, though frontal, is occasionally referred to the external angular process of the frontal This type of headache is characteristically present in morning, becoming worse with the use of the eyes for near work.

ETIOLOGY.—Minor injuries of the brain cause headache, according to W. Trotter (Lancet, May 10, 1924), by disturbing the intracranial pressure. From the arrangement of the dural septa, a local reduction in pressure can give rise to painful stretching until the disturbance has become equalized, i.e., the identical mechanism exists which prevails in headache due to the withdrawal of fluid by a lumbar puncture. When the condition is severe or rapidly progressive, the consequent headache is continuous; when stationary or only slowly progressive, the headache is apt to be only paroxysmal. This latter is the case with a certain number of slowly growing cerebral tumors in their early stages, and is almost characteristic of traumatic headaches. increase of tension is associated with 1 of 2 conditions of the brain itself:

When the headache follows concussion, the brain is edematous and exudes an excess of fluid when exposed. When it follows a localized blow on the head, the brain shows by its swelling and blood-staining that it is the seat of a localized bruising.

According to E. R. Carpenter (Tex. State Jour. of Med., Apr., 1924), over 75 per cent. of the late disabilities from head injuries in industrial work are due to headaches which arise from injury to the dura mater and meninges, edema of the brain, spicules of bone, abscesses, cystic conditions, or from bony changes.

Among 200 consecutive cases of syphilis with early skin lesions seen by I. C. Sutton (Cal. State Jour. of Med., Jan., 1923), the symptom most complained of in 8 instances was headache, and to a milder degree in 42 cases. The pain may vary from a dull throbbing ache in mild cases to severe flashes, accompanied with fever, giddiness, slow pulse, and even convulsions. It is consistently worse at night. As a rule, the pains start in the occipital region and spread up over the vertex in lightning-like flashes, but do not follow the course of any especial nerve.

TREATMENT.—The "vacuum headache" referred to by Berrisford (loc. cit.) lends itself readily to a reliable therapeutic test. If a patient appears during an attack of headache he places a pledget saturated with 1:1000 adrenalin solution or an astringent beneath the middle turbinate for a few moments. If after a short time the headache disappears or is diminished, this is strong presumptive evidence that it is due to insufficiency or lack of aëration of the frontal sinus. Treatment con-

sists of applications of astringents to the region of the nasofrontal duct, and when this appears inefficient or inappropriate, surgical procedure for the purpose of removing pathological or purely obstructive tissues.

Baastrup (Ugeskr. f. Laeger, Feb. 1, 1923) recommends trial of calcium treatment in cases of rebellious headache for which no special cause can be discerned. In some such patients a tendency to recurring Quincke's edema suggested that the headache might be due to intracranial extension of the process, and that calcium would be logical treatment. familial predisposition was always evident. The recurring attacks and puffiness under the eyes, swelling of the lips, and other manifestations were accompanied by severe head-The writer gave calcium lactate, 1 Gm. (15 grains) 1 to 3 times a day for 3 weeks, and then at longer intervals for 10 days. The edema and the headache subsided, as also a vasomotor rhinitis, previously refractory for several years. The blood may show a lymphatic tendency in nervous headache, and this is a further indication for calcium treatment.

Tofte (*Ibid.*, Feb. 8, 1923), in a case of rebellious headache after abortion, found the blood of the lymphatic type, with the patient weak and languid. Under calcium normal conditions were restored and a normal pregnancy followed. The calcium was kept up throughout, and a transient headache occurred but once.

In severe headache following lumbar anesthesia, Lundwall and Mahnert (Klin. Woch., May 7, 1923) injected 40 c.c. (10 drams) of a 40 per cent. solution of hexamethylenamin into the ulnar vein in 12 patients, with prompt

benefit. Hypertonic solution seemed also to answer the desired purpose of regulating the intracranial circulation.

To avoid lumbar puncture headache, C. S. Bluemel (Jour. Amer. Med. Assoc., Jan. 19, 1924) uses a 3-inch No. 24 Luer needle for the puncture. A sliding sleeve serves as a "holder" and prevents the bending and wobbling that would otherwise occur in performing puncture with a small caliber needle. The obturator is made of No. 0 cast steel music wire. The small needle must be exquisitely sharp, thus reducing the size of the puncture hole in the dura and diminishing the escape of spinal fluid into the tissues. Marked decrease in the incidence of postpuncture headache

In the headache of essential hypotension, as in some neurotic individuals, or in anemia, according to A. C. Morgan (Atlantic Med. Jour., Jan., 1925), the use of digitalis at bedtime, and belladonna, hyoscyamus and camphor more frequently, often affords good results. In this type the headache is present on arising and clears up towards evening. In the anemias, regardless of the cause, arsenic is in order, sometimes in the form of sodium cacodylate injections if oral administration fails. Lenker (*Ibid.*) refers to the utility of pituitary substance in the bitemporal headache associated with pituitary disturbance in young individuals, usually after passing through a period of rapid growth. In the headache associated with menstrual disturbance, usually occipital and extending up over the top of the head, much can be done with corpus luteum, 5 grains (0.3 Gm.), pituitary substance [whole], 2 grains (0.12 Gm.), and small doses of thyroid gland given 3 times a day, with such uterine tonics and nerve sedatives as are indicated.

HEART.—DIAGNOSIS.—The tendency to "excessive diagnosis" of heart disease is deprecated by J. Parkinson (Can. Med. Assoc. Jour., Sept., 1924). No heart disease of importance occurs in the absence of shortness of breath on exertion. Pain about the sternum while walking is another important symptom. One should not overestimate the importance of certain physical signs when unassociated with other evidences of cardiac disease. A systolic murmur, whether at apex or base, if softly blowing and unassociated with any cardiac enlargement or with symptoms of heart disease, can in the majority of non-rheumatic cases be ignored. Tachycardia and bradycardia of themselves do not necessarily indicate heart trouble. When angina pectoris, early valvular disease, high bloodpressure and functional nervous diseases can be ruled out, if there is no adequate cause to affect the heart and it is not enlarged, and if there is no breathlessness or pain on exertion, the diagnosis of a healthy heart is justified.

A large proportion of patients with cardiovascular disease, according to J. A. Lichty (South. Med. Jour., Feb., 1924), describe as their leading symptoms those referable to the digestive tract. The anatomic relations of the heart to the liver, stomach and intestines are responsible both directly and indirectly for the production of the abdominal symptoms. There is early engorgement of the portal system. The nerve-supply of the heart and the stomach is from the vagus and the sympathetic, and this intimate relation explains the reflex effect of vagal or sympathetic disturbance of the heart upon the abdominal organs. These principles apply also to treatment; not only must the heart be stimulated, but the load must be taken off it.

Physical Signs.—The physical signs of heart disease were studied by T. Ziskin (Jour.-Lancet, Aug. 15, 1923) in 401 cases observed at the Cardiac Clinic of the Univ. of Minnesota. Of this number, 54 per cent. could be classed definitely as cardiac disease, while 46 per cent. were non-car-

diac. Of the 218 cardiac cases, 12 per cent. were due to syphilis, 42 per cent. to rheumatic affections, and 46 per cent. to arteriosclerotic and degenerative changes. Valvular disease was present in 92 cases. The mitral valve was most commonly affected, vis., in 90 per cent.; of these, 65 per cent. were purely mitral, while 32 per cent. showed some aortic defect; 10 per cent. were purely aortic. The majority of patients with valvular disease do not live beyond the 5th decade. In this series 70 cases, or 18 per cent., showed functional murmurs; in 40 of these the murmur was non-cardiac. The mitral systolic murmur, without any other signs in the heart, may be disregarded entirely. Diastolic murmurs, however, always indicate cardiac disease. Pulmonic stenosis is of import only when there is also a systolic thrill over the pulmonic area, marked cyanosis of the hands and face, and a corresponding enlargement of the right heart. Mitral stenosis is shown by an apical diastolic or presystolic rough murmur which usually leads into a snapping first tone, accompanied by a thrill and marked accentuation of the pulmonic 2d sound. In aortic regurgitation the murmur is soft and blowing, and is heard best along the left border of the sternum, with the point of greatest intensity at the level of the 4th rib. Other signs, as Corrigan pulse, capillary pulse, high pulse pressure, with evidence of enlargement of the left ventricle, are usually present.

As regards the arrhythmias, there were 75 cases which showed some definite irregularity of heart action, the most common being extrasystoles, 45, and auricular fibrillation, 26. Heart-block and pulsus alternans were present in 1 case each, and branch-block in 2 cases.

In the myocardial group there were 126 cases, including cases of arteriosclerosis, cardiac hypertrophy with hypertension, cardiac hypertrophy, hypertension, aortitis, angina pectoris and miscellaneous conditions. Myocardial disease is also associated with the valvular conditions.

The diagnosis of effort syndrome should be made only after all signs and symptoms have been thoroughly investigated and organic disease definitely ruled out. The cases usually fell under 1 of the following

headings: Constitutional inferiority; unrecognized infection, as focal infection of the teeth, tonsils or gall-bladder; incipient tuberculosis; unrecognized heart disease; metabolic or endocrin disorders, such as toxic hyperthyroidism.

Early diagnosis of incipient heart disease is assisted, according to Rimbaud, Boulet and Puech (Presse méd., Feb. 20, 1924), by recognition of variations in the bloodpressure from 1 heart-beat to the next. These variations are most delicately detected by auscultation of an artery occluded by the sphygmomanometer. When, on relaxing the pressure in the cuff, the 1st arterial sound is heard, other systolic sounds fail to be heard even though the corresponding waves be palpable, or they may be heard irregularly, in groups or other combinations. The phenomenon has no relation to respiration, and is detected in the resting subject, requiring no exercise for its development. It may be utilized in preventing needlessly rapid impairment of a slightly defective heart, permitting heart tonics to be used preventively, frequently to great advantage.

Functional Tests.—As noted by Magnus-Alsleben (Klin. Woch., Jan. 1, 1924), most functional tests are based on determining the behavior of heart, vessels and respiration after physical exertion. The heart is considered efficient if, after extra work, such as bending the knees or some similar movement, the changes (increased heart rate) occur only to a moderate degree and for a short time. In truth, this shows only that there is sufficient compensative power, which is not the essential point. The main point to be established is whether the added strain injures the heart. The simplest and most helpful method is based on the pulse rate and respiratory frequency, and the promptness of their return to normal after a measured amount of muscular work. The amount of work is adapted to the age, constitution and physical training of the patient. After a healthy young man, with a pulse rate of 70 to 80 and respirations of 18 to 20, bends his knees about 40 times the pulse rate will be about 115 and the respirations about 30. The pulse and respiration rates will return to normal within a minute, at the most.

Some clinicians test the heart function by

means of blood-pressure determinations. This, however, affords more information about the adaptability of the vasomotors.

The Roentgenologic method is still unsatisfactory but hopeful. The intensity and duration of systole and diastole cannot be represented accurately enough by this means.

The pulse volume, indicating the cardiac work, suggests itself as a reliable test; but it has proven unsatisfactory, although changes in the pulse volume can be determined with a mirror sphygmograph from the pulse in the central arteries. In an electrocardiogram of a heart with good function the last of the normal peaks is especially pronounced. No useful functional test, however, can be based on this. Plethysmography gives information only in regard to the variations of the arterial blood content of a part, i.e., the volume pulse. The same is true of tachography, which registers the current pulse. Palpation of the pulse tests not only its frequency and rhythm, but also its tension and hardness. Sahli tried to determine arithmetically the "strength" of the pulse-the "living strength" with which pressure is exerted against the palpating finger or the "energy" displayed by the blood current. These features form the principle on which the pressure bolometer and the volume bolometer are constructed, registering the work of the pulse wave.

On the whole, the tendency at the present time is to regard functional tests as of doubtful value. A. E. Renner (Med. Jour. and Rec., Mar. 19, 1924), in fact, holds that there are now no reliable functional heart tests. Those having as aim the calculation of cardiac muscle value are not reliable guides. Blood-pressure readings, pulse increase comparisons, estimation of heart sounds, apical excursion, the occurrence of such signs as palpitation upon a given exercise, or, perhaps, the pain and dyspnea syndrome, do not offer the least dependable index of cardiac vital capacity. Ziskin (Minn. Med., Aug., 1924), after elaborate studies, likewise regards the majority of functional tests as of little value. Thorough study of the history and symptoms, with a complete physical examination, will give more information as to the functional capacity of the heart than all tests.

An opposite stand, in a sense, is taken, however, by S. Calvin Smith (Jour. Amer.

Med. Assoc., Apr. 7, 1923), who holds that it is possible by electrocardiography to detect cardiac disorders which cannot be recognized by any other method. It indicates also (1) the effects on the heart of toxins where the organ may not be diseased; (2) the innocent nature of various pulse irregularities; (3) the presence of structural heart defects which cannot be determined by other methods. He deems electrocardiography of special importance in life insurance examinations. Its use in determining the mode of action of endogenous toxics is illustrated by J. E. Wood, Jr., and P. D. White's (Amer. Jour. Med. Sci., Jan., 1925) observation, in several cases of uremia and chronic nephritis with increased blood nitrogen, that the toxic effects on the heart resembled those of digitalis.

Fluoroscopy. — Aortitis, dilatation and aneurism of the aorta are readily established, according to Burnett (Colo. Med., Aug., 1924), by fluoroscopy. This applies also to the influence of motion on the heart, particularly where an oblique view of the organ is obtained. With findings from other directions, the procedure is valuable by insuring correlation of all data. In L. Bishop's opinion (N. Y. State Jour. of Med., May, 1923), fluoroscopy is particularly valuable as a routine procedure in the examination of large numbers of patients to determine which are deserving of detailed cardiologic study and which are not.

A broader field, vis., one relating to the determination of the quality of the heart muscle, is accorded fluoroscopy by H. Spiro (Radiol., Dec., 1923). A heart of good muscular quality should show thoroughness in contraction and relaxation and fairly large pulsatory waves. While small hearts pulsate with more vigor and thoroughness than normal-sized or slightly large hearts, a small heart which contracts sluggishly or with limited pulsatory wave indicates insufficiency of the musculature and would yield more readily under strain. The female heart does not contract with as large an amplitude of visible motion as that of the male. Waves of very large amplitude suggest a valvular lesion; in most cases, however, the heart muscle is of good quality, otherwise the patient would soon

die. While an enlarged heart may be healthy (a family type), on the whole, the larger the heart the poorer its quality. If to this is added very little visible motion, evidence exists that the greater part of the heart is composed of defective muscle. Although large hearts do not need to contract as much as smaller ones to supply the body with its proper quota of blood, a large healthy heart has greater reserve power, being quite able to speed up until an equilibrium is established during strain. Large healthy hearts act more slowly and empty more thoroughly than large unhealthy ones. The author agrees with Holmes, Bissell, Bishop, Vaquez and others that one can judge the probable efficiency and reserve power of the heart by a fluoroscopic study of its pulsatory waves.

A study of 350 cases of cardiac disease in children by C. W. Perkins (Radiol., June, 1924) led him to regard Roentgenoscopy as an aid in confirming physical signs. It affords an accurate method of differentiating normal from abnormal hearts in children at different ages, while the progress of the disease may be noted by successive examinations. As a method of differentiating between congenital heart disease and thymus gland disease it is invaluable. Associated pathologic conditions of the chest can also be demonstrated.

F. N. Wilson and E. F. Merrill (Amer. Jour. Med. Sci., Mar., 1923) warn, however, against basing a diagnosis of cardiac enlargement on the X-ray findings alone, particularly in cases in which no cause for such enlargement can be found.

Vaquez and E. Bordet (Paris méd., July 5, 1924) point out that certain patients may have for years physical signs apparently indicating a good adaptation, while on the contrary, repeated fluoroscopies show that the lesions are slowly progressing, and that incessant treatment is necessary in spite of Again, fluoroscopy someappearances. times reveals such sudden changes in the volume of the heart or aorta that grave complications may be foreseen and the need of emergency treatment recognized. In moderate hypertension, there may be a rather sudden rise of blood-pressure, and it becomes necessary to know how the heart bears the strain; a marked increase in size of the left ventricle revealed by the

X-ray indicates dilatation and the need for suitable treatment. Successive fluoroscopies may be useful to regulate treatment or account for inefficiency of the latter by revealing a progressive exhaustion of the myocardium. In differentiating hypertrophy from dilatation, valuable evidence is afforded by the changes in heart volume shown in successive fluoroscopies, a rapid increase or decrease pointing to a dilatation, while a slow or stationary enlargement indicates hypertrophy as the chief process present.

P. Eisen (Radiol., Sept., 1924) states that in the usual technic the central ray passes obliquely downward from the 6th dorsal rib, to separate the heart from the dome of the diaphragm. This is possible in the average patient, but in all large and especially stout patients, weighing 200 pounds or more, very little of the heart is seen on the Roentgenogram because, with the degree of inspiration at which the exposure is taken, most of the heart shadow is hidden in the shadow of the diaphragm. If, however, the focal point is lowered to the 10th rib to overcome some of the distortion, and at the same time the patient takes an extremely deep breath, holding it a second with open mouth, and the exposure is then made, not only will a correct heart shadow be obtained, but it will be entirely separated from the diaphragm.

CONGENITAL DISEASE.—According to Lemaire and Blechmann (Nourrisson, May, 1924), the diagnosis of congenital heart disease in infants should be based mainly upon cyanosis and the auscultatory findings. Edema, dyspnea and retardation of growth are inconclusive. Cyanosis may be generalized or partial, permanent or intermittent. often, but not always, accompanied by increase of erythrocytes, the count sometimes reaching 9,000,000. Clubbing of the fingers and curving of the nails, due to deficient oxygen, occur fairly often. Attacks of pallor following exertion, such as that required in nursing, are very suggestive. Cyanosis is caused by lesions permitting mixture of venous and arterial blood, and is absent unless the lesions are of this type; in infants it is nearly always of cardiac origin. If it is due to leukemia or erythremia, the blood count should prove decisive. Intermittent cyanosis may be due, in the newborn, to conditions of the umbilical circulation or to compression of the vessels of the neck. Later, it may be caused by glottic spasm, non-spasmodic apnea, convulsions, thymic hypertrophy, or tracheobronchial adenitis. Localized cyanosis of vasomotor origin is usually accompanied by edema.

DILATATION.—The possibility of horizontal dilatation of the left auricle is often overlooked. Batty Shaw (Lancet, Sept. 6, 1924), in a patient who suffered from shortness of breath and palpitation, elicited a large area of dulness to the right of the midline, continuous with the cardiac dulness, reaching up to the 3d right intercostal space and well beyond the right midclavicular line. In the 3d space the dull area revealed a well marked systolic murmur. A distinct pulsation in the same space outside the midclavicular line was also present. The diagnosis of horizontal dilatation of the left auricle was confirmed both by X-ray and at the autopsy.

An extreme dilatation of the left auricle was observed by J. G. Emanuel (Ibid., Mar. 24, 1923). The heart seemed to fill the entire thorax. This was due to auricular dilatation, particularly the left auricle, in a horizontal direction. During life it presented in the right axilla, beyond the right edge of the right auricle, and was tapped under the belief that it was a pleural effusion.

For the diagnosis of dilatation of the left auricle H. Elias and K. Hitzenberger (Wien. klin. Woch., Apr. 9, 1923) employ moderate percussion posteriorly. This elicits paravertebral dulness near the 3d and 5th thoracic vertebræ, the area being oval and measuring about 4 or 5 fingerbreadths. This unusually high position of the dulness is explained by displacement of the left bronchus.

According to E. Weiser (*Ibid.*, Jan. 30, 1923), small hearts with thin walls, unable to hypertrophy, do not get dilated. Dilatation being a compensatory mechanism, such patients die very quickly if the heart becomes insufficient. Conversely, the big strong hypertrophic hearts can be repeatedly dilated without having ever caused a deficiency of circulation.

INSUFFICIENCY.—As noted by R. Miller (Brit. Med. Jour., Oct. 20, 1923), efficient treatment of heart disease in rheumatic subjects requires early diagnosis and adequate treatment of the infection. Subduing the latter by salicylates while sparing the heart as much as possible by rest constitutes the best preventive of cardiac rheumatism. Once the heart is hopelessly damaged and the patient in a chronic rheumatic toxemia, the action of salicylates is disappointing.

J. Meakins (Lancet, Apr. 26, 1924) holds that cardiac efficiency is subject to a general law which applies to all functioning tissues. Briefly, an organ performing its work with difficulty undergoes a gradual deterioration if increased activity is persisted in. Conversely, if the work demanded of a diseased organ be less than its capacity at the moment, a certain degree of restoration of func-

tion will ensue. This law is of import in the treatment of cardiac deficiency. When the myocardium is suffering from any abnormal mechanical handicap and shows signs of failing, it should be given as nearly as possible absolute rest, to enable it to regain some of its lost power.

Lutembacher (Presse méd., Jan. 5, 1924) finds that in insufficiency of the right ventricle, edema is sometimes so marked in the arms as to make intravenous injections at the usual point impossible, while the administration of digitalis by mouth is ineffectual on account of portal stasis which prevents absorption of the drug. Ouabain in these cases has a more immediate and pronounced action on the heart than digitalis. One should not hesitate to use the jugular veins for its administration, for they are distended and usually easily ac-To avoid any irritating cessible. action on the endocardium, the ordinary solution of ouabain is diluted in 1 to 2 c.c. of sterile water and the injection made slowly toward the head. Two injections of 0.25 mgm. ( $\frac{1}{260}$ ) grain), or a single one of 0.375 mgm. (1/175 grain), should be given in the first 24 hours, the same doses being repeated on the 2d day; or, if there is no bigeminy and no excessive slowing of the pulse, a single injection of 0.5 mgm. (1/130 grain) may be made on each of the 2d and 3d days. Excellent results were thus obtained.

According to A. Fraenkel and H. Doll (Deut. Arch. f. klin. Med., Aug., 1923), digitalis acts only in true insufficiency of the heart, i.e., when 1 or both ventricles are so greatly impaired that, at least for a time, there is an unequal distribution of blood in the individual organs. It is used, therefore, to influence the myogenic dilatation of hypertrophic hearts and equalize

the distribution of the blood. Neither infarcts, hypertension nor the arrhythmias are contraindications to it. All types of cardiac insufficiency (peripheral, pulmonary and hepatic) react in their chronic and acute forms (cardiac asthma) to digitalis. Even where rest suffices to overcome the signs of heart weakness it should be used, as there is no habituation to it. Intravenous injections of strophanthin (Boehringer) are used by the authors as a standard for judging the degree of heart insufficiency. They distinguish 3 types:

(1) Cases in which a single brief course of digitalis treatment restores compensation for years. The transverse diameter of the Roentgen outline of the heart in such cases is only slightly enlarged, to 16 cm.

(2) Cases in which more prolonged serial treatment leads to a partial restoration of compensation. The effect of digitalis occurs more slowly and only after larger doses, and lasts only so long as the patient can adapt his mode of life to the degree of sufficiency that remains. In these cases the treatment should be continued a long time even after true reparation of the visible signs of insufficiency, as long as the injection of strophanthin brings about subjective improvement. Usually 0.5 mgm. of strophanthin is sufficient for 48 hours. If the interval between injections can be gradually lengthened wihout signs of stagnation, this is a favorable sign; if it is necessary to give the injections closer together or to increase them, irreparable heart weakness is indicated.

(3) Cases in which continuous intravenous strophanthin treatment is necessary. This overcomes the severest subjective symptoms, prolongs life and produces The injections can be coneuthanasia. tinued for months, whereas sufficient amounts by mouth would produce severe gastrointestinal disturbances. Rectal administration avoids irritation of the stomach, and in congestion of the liver has the advantage that the drug enters the vena cava without passing through the portal circulation. But sufficiently exact dosage is not possible, nor can rectal administration be continued long enough; therefore it cannot replace intravenous administration. In the severest cases it is often necessary to increase the daily dose of strophanthin

from 0.5 to 0.8 mgm. (1/130 to 1/30 grain). The transverse diameter of the heart is generally 18 to 22 centimeters in this group.

After a long series of injections nausea and vomiting may occur, but much more rarely than on internal use. Disturbances of rhythm are often observed. If coupled beats occur the treatment can usually be continued in decreased doses. Intermittences do not prevent the treatment and can be overcome by giving atropine at the same time. In auricular flutter energetic digitalis treatment may produce excessive slowing, which disappears when the dose is decreased; if it occurs during strophanthin treatment it can be decreased by simultaneous use of quinidine. There may be danger from overdosage; the normal dose is 0.5 mgm. per day, and it should never exceed 0.8 mgm.

> According to L. Blum (Méd. d'Alsace et de Lorr., Jan. 16, 1924), the intravenous route should be availed of only in acute emergencies. French official 1:1000 digitalin solution, while very irritating when given subcutaneously or intramuscularly. may be used with little or no resulting pain by adding to every 10 drops of the digitalin solution 1 or 1.5 c.c. (16 or 24 minims) of 5 per cent. procaine solution. Care should be taken to inject only in tissues that are not edematous, lest absorption be hindered. He generally injects 10 to 20 drops of the digitalin twice daily, in particular in cases with marked visceral stasis hindering drug absorption and in cases of gastric intolerance.

> In mitral stenosis and insufficiency, as well as in emphysema, F. Brunn (Med. Klin., Oct. 26, 1924) has seen dyspnea relieved by intravenous injection of pituitary extract. In 1 case, edema of the lungs developing suddenly in a case with hypertension and angina pectoris was checked by such an injection. In cardiac asthma, Peller (Wien. klin. Woch., Mar. 8, 1923) advocates the induction of venous stasis in 1 or more extremities. C. Wilson (Lancet, Dec. 22, 1923) comments on the effects of morphine in moderate or even very small doses in relieving

cardiac dyspnea. Not only does it restore the normal respiratory rhythm, sometimes very rapidly, but orthopnea is lessened or abolished, fluid exuded into the bronchi is absorbed, and these improvements last for days and even months.

Patients whose cardiac phenomena depend upon reflex causes, gastric in origin, are admirably suited, according to B. Parsons-Smith (Med. Jour. and Rec., Mar. 19, 1924), to physical methods. In addition to the beneficial effects of rest and starvation, much permanent relief is afforded by the prescription of daily lavage and abdominal massage, combined with passive exercises and depletive movements of the extremities. Resistance movements are substituted for the passive exercises as soon as possible, the exercise tolerance being watched with care during the whole progress of the treatment.

RUPTURE.—Rupture of the heart is caused, as a rule, according to Aubertin (Presse méd., June 4, 1924), by an infarct and exceptionally by an abscess, gumma, cyst or aneurism. He refers to cases in which the patient lived from 4 to 72 hours after the shock of infarction. Two clinical phases are involved: The 1st and long phase, corresponding to obliteration of the coronary artery and ischemia of the myocardium, and the 2d, brief phase, attended with infiltration of the wall of the ventricle with blood, rupture, and hemopericardium.

R. L. Ley (Lancet, May 12, 1923) reports a case of spontaneous rupture of the heart. The predisposing cause was evidently old age, the patient being 85 years of age, with a fatty heart. There could hardly have been any great exertion.

Another case of spontaneous rupture was observed by Hosking (Med. Jour. of Australia, Oct. 4, 1924) in a woman aged 70, a mental patient, who

collapsed while taking a bath and died 15 minutes later. The necropsy disclosed 2 slits or tears in the left ventricle. The whole myocardium was pale and flabby and heavily infiltrated with fat. Both coronary arteries were rigid and calcareous.

SYPHILIS.—Of 50 syphilitic patients whom T. Howard (Amer. Jour. Med. Sci., Feb., 1924) examined during the secondary stage, 8 complained of palpitation of the heart, 5 of cardiac pain and 3 of dyspnea, while 1 had edema.

In the treatment of syphilitic heart disease, Jacobaeus (Ugeskr. f. Laeg., Mar. 20, 1924) deems it very important to combat the cardiac insufficiency first, then start with mercury, and continue with mild arsphenamin treatment unless it is certain that cicatricial lesions are not involved. When there are murmurs and other symptoms, the lesions are usually beyond correction. In a case described, the syphilis had been treated with inunctions alone, and 10 years later aortitis developed, with dyspnea, palpitations and dizziness. The man, aged 41, was given 2.45 Gm. of arsphenamin in the course of 6 months (6 injections). He then developed diarrhea, intractable vomiting, enlargement of the liver and jaundice, with fatal collapse on the 9th day. In another case, a large aneurism developed above the right clavicle in the course of a month, 13 years after papules in the mouth had been noted as the only manifestation of syphilis. Under a single injection of arsphenamin, the aneurism began to subside, and entirely disappeared under 2 or 3 more injections.

WOUNDS.—H. Klose (Arch. f. klin. Chir., Apr. 30, 1923), in a review of the results of tamponing of the

heart and the clinical symptoms of gunshot wounds of the heart, the prognosis and treatment, states that pulling out the heart or bending it has sometimes arrested threatening hemorrhage from that organ. It has, however, to be done very cautiously. Silk is the only material to use for suture. In 8 cases on record a projectile lodged in the heart wall was removed on account of later disturbances. In 56 cases of gunshot wounds, the mortality was 31.3 per cent. in those involving the left heart, and 38 per cent. in the right heart. Of 32 patients given operative treatment, 31.3 per cent. died, while of 24 treated conservatively, 37.5 per cent. died. Operative measures are always indicated, except, perhaps, in a wound of the right heart; even then, careful technic may modify the grave prognosis of such injuries.

Dshanelidize (*Ibid.*, Dec. 30, 1924) collected 535 cases recorded during 25 years up to 1921, reporting his findings as to the ultimate outcome after operations on the heart. Operation for a stab wound had been done in 402, and for a projectile injury in the remainder. The immediate mortality was 56 per cent. In 96.5 per cent. of 113 cases traced from 2 months up to 18 years, the heart functioning did not seem to be impaired. Even prolonged complicating infection did not prevent satisfactory recuperation of function. The location of the wound and operative technic seemed immaterial. sutured heart passed through infectious diseases, abuse of alcohol and tobacco, long operations and the strain of childbearing.

In a case of a young man with a wound of the left auricle, reported by 31

Vautrin and Guillemin (Revue de chir., lxii, 294, 1924), 1 hour and 45 minutes elapsed after the stab before any signs that the heart had been injured appeared, aside from a faint soon after the injury. He recovered after the pericardium had been cleared out and 4 stitches taken in the auricle. Out of 29 recorded instances of stab wounds of either the right or left auricle, the wound was in the 3d interspace in 11.

**HEAT EXHAUSTION.**— Of 22 infants in a Lyons Hospital, 16 suffered from heatstroke, 8 dying, during a hot wave in 1922. Weil and Bertoye (Nourrisson, May, 1923) states that all were doing well when suddenly their temperature rose, and remained high, without appreciable morning decline. The skin and the mucous membranes of the mouth and nose were dry, the pulse small and often uncountable, and restlessness was extreme, but there were no convulsions nor any gastrointestinal de-The infants who surrangement. vived began to improve after 3 days, and recovered without sequelæ. The thermometer registered 93.2° F. in the shade. Experience has shown that a temperature above 86° is dangerous to young infants, especially when the humidity is high. Some infants owed their survival to cool baths for 10 to 20 minutes every 3 hours. Since then, the hospital air has been cooled with ice. Three zinc boxes, each containing 66 pounds of ice, were placed in the central aisle of the ward. An electric fan above the box, playing on the ice, distributed the chilled air to all parts of the ward.

> In a case of heat stroke observed by Van der Koor (Ned. Tijd. v. Gen., Oct. 11, 1924), the patient had been haying all day when he fell unconscious, with

Cheyne-Stokes breathing and convulsions. Venesection and caffeine afforded relief, but meningeal symptoms developed, with deafness and blood clots in the vitreous humor, entailing blindness. All the symptoms gradually subsided except the blindness. Attempts to remove the blood clots in the eye led to loss of 1 eye, but the clots in the other eye were spontaneously absorbed by the end of the year.

HELIOTHERAPY. - A practical application of heliotherapy has been described by W. G. Turnbull (Atlantic Med. Jour., Dec., 1923) which illustrates clearly its therapeutic value. Since 1919 the children at the State Sanatorium at Cresson, Pa., on the top of the Allegheny Mountains, have been treated with direct heliotherapy. They have been divided into 2 classes: (1) Those with complicating surgical tuberculosis or who are too ill to be allowed school and playground activities, and (2) those (by far the larger group) who go to school and exercise on the playground. The children of the 1st group were treated after the method of Rollier, the feet and legs up to the knees being first exposed to sunlight for 15 to 20 minutes daily, with special care to avoid sunburn; the time and area were then gradually increased until by the end of the 3d week the whole body could be exposed to the sun. An arbitrary maximum of 3 hours daily was set, this being divided into 2 equal periods. No bad results occurred, even in the positive sputum cases. There was rapid disappearance of cough and joint pains, discharging sinuses dried up, and temperature became normal. The wasted muscles filled out, even in children taking no exercise, and there was gain in appetite and weight. In the 2d group it seemed undesirable to interfere with normal activities and school work; a modified form of treatment was therefore adopted. The boys were dressed all day in the lightest procurable bathing-suit, and the girls wore a loose-fitting, one-piece, bifurcated garment, reaching from the angles of the scapulæ to the middle of the thighs, and held up by narrow shoulderstraps. Shoes, stockings and underwear were discarded. The results were most

satisfactory. There was remarkable freedom from ordinary colds and nasal infections; vitality was greater, sleep sounder, and improvement in the tuberculous condition more rapid.

**HEMATEMESIS.**—This condition occurred in 3 cases observed by Monod (Brit. Med. Jour., Apr. 12, 1924), without apparent lesions. Gastric or duodenal ulcer had been diagnosed, but was not found at operation. In 2 of the cases there was oozing from, perhaps, microscopic erosions. In the 3d case the bleeding was from congestion due to duodenal stenosis. The possible causes of the bleeding were: Disturbance of the normal reaction of the general nervous system on the visceral system; irritation of the sympathetic vasomotor centers in the tractus intermedio-lateralis of the medulla, or of the nerve ganglions or nerve endings, and hepatism.

Hematemesis may appear as a precancerous sign. Thus, Delort and Luquet (Arch. des mal. de l'app. dig., Jan., 1925) observed a case of repeated hematemesis with melena, wrongly diagnosed as duodenal ulcer on account of hyperacidity and delayed evacuation of the stomach. The operative findings showed no ulcer, but changes in the mucous membrane of the stomach characteristic of the precancer stage.

In a case observed by Gödel (Wien. klin. Woch., Nov. 13, 1924) in an old woman, death occurred after several grave hemorrhages from the stomach. No local macroscopic lesions were found at necropsy, and the preliminary diagnosis was "parenchymatous bleeding." Histologic examination, however, revealed extensive arteriosclerosis of the vessels of the stom-

ach, and miliary aneurisms. The cervical and celiac ganglia were degenerated. He quotes 5 similar cases.

## HEMATOPORPHYRINURIA.

—A case of hematoporphyrinuria congenita was observed by H. T. Ashby (Brit. Med. Jour., Nov. 1, 1924) in a child of 12 months, which since birth had stained its napkins red and at 4 months had had a rash on the hands and face resembling chickenpox. At 2½ years the teeth were dark red. One of the teeth being ground, the red color persisted as deep as the grinding could be carried out. Hydroa vacciniforme appeared on the face, back of hands and front of the knees when the child was 1st seen. The family history is negative.

HEMATURIA.—Pelouze (Atlantic Med. Jour., Oct., 1924) emphasizes the importance of seeking the source of the hemorrhage in every case, cystoscopy being of the greatest aid to that end. To allow these cases to go unstudied until the bleeding has ceased often delays the correct diagnosis for an indefinite period. The time properly to study a patient with hematuria is while there is bleeding. Certain definite contraindications to a cystoscopic study exist, but if none of these are present it should not be postponed.

The value of cystoscopy in hematuria is also urged by Crance (N. Y. State Jour. of Med., Mar., 1923), as this symptom is a warning signal of pathology in the genito-urinary tract, while the mildest case of bleeding may prove to be one with a most serious lesion.

D. W. MacKenzie (Surg., Gyn. and Obst., Aug., 1924) analyzed 821 cases of hematuria. Pyelitis had been the cause in 132 cases; kidney tuberculosis, in 88; kidney calculus, 64; ureteral calculus, 87; cystitis, 38; vesical

calculus, 38; tumor of bladder, 87; chronic inflammation of prostate with tuberculosis, 39; prostatism, 54. In 60 cases the blood came from the urethra. Excluding the urethra, 536 cases out of 761, i.e., over 70 per cent., were due to calculi, tuberculosis, cancer or surgical lesions of the kidney. The great importance of subjecting these patients to a careful and thorough examination is emphasized anew.

In a case observed by P. Janssen (Zeit. f. urol. Chir., Oct. 3, 1924), however, examination of the entire kidney would have been fruitless, since the entire capsule was found separated from the surface of the kidney by a layer of blood. Minute histologic examination showed congenital abnormalities in the walls of the arteries in the parenchyma, allowing diapedesis. The extravasation had probably progressed since childhood. Vague pains at times had not been heeded until the age of 19, when, after 5 days of intense suffering and hematuria, the kidney was removed. The capsule was doubtless on the point of bursting.

In 2 cases seen by Van Houtum (Ned. Tijd. v. Gen., June 14, 1924), persistent hematuria disappeared in 2 and 5 days after the renal pelvis had been treated with a 5 per cent. solution of silver nitrate as a last resort before the contemplated operation.

HEMOGLOBINURIA.—An epidemic rigidity of the muscles with hemoglobinuria was observed among the fishermen of the Haff. In a study of the subject, L. Lewin (Deut. med. Woch., Jan. 23, 1925) reached the conclusion that it was due to poisoning with a volatile arsenical compound. O. Lentz (Med. Klin., Jan. 4, 1925) concluded that Lewin's hypothesis of a poison containing arsenic was correct. Two cellulose factories had been using Spanish

pyrite containing much arsenic. The water of the river Nogat having been diverted to regulate another river, the waters of the Haff stagnated. Comparatively large amounts of arsenic were found in the water and sediments of the Haff and in the urine and organs of the patients. Schnabel injected 1 c.c. of the filtered water into himself and into one of the convalescents. It produced a typical attack. The whole experience affords a warning to the various industries in which arsenic is used.

HEMOPHILIA.—According to Carnot and Blamoutier (Paris méd., Dec. 6, 1924), intravenous injections are preferable to other routes of administering calcium chloride. In 3 cases of grave hemophilia they found the injections reduced the coagulation time by 35, 23 and 16 minutes, respectively, the tendency to hemorrhage subsiding simultaneously. Oral administration seemed futile. About 20 c.c. of a 5 per cent. solution was usually employed for each injection, the treatment consisting of 1 or 2 series of 10 or 12 injections.

L. D. Cady and E. L. Shrader (Jour. of Lab. and Clin. Med., June, 1924), in 2 cases of hemophilia, also used sodium citrate, injecting intravenously 4 Gm. in 100 c.c. of physiologic sodium chloride solution. There was immediate prolongation of clotting time followed by a marked shortening. These effects appeared to be related to changes in the blood platelets.

In a case observed by E. Wild (Mitteil, a. d. Grenzgeb, d. Med. u. Chir., xxxvii, 201, 1924) in a boy of 15, spontaneous rupture of the spleen necessitated splenectomy. After this operation no further bleeding oc-

curred. This is the 6th case on record of a cure of hemophilia after splenectomy. Transfusion of blood and serum has only a comparatively brief action, but it may improve conditions enough to render splenectomy possible.

In 1 case, H. Neumann (Med. Klin., Jan. 28, 1923) arrested the bleeding from the nose with 1 local and 1 subcutaneous application of pituitary extract.

According to J. and V. Garcia Donato (Siglo med., June 30, 1923), Roentgenotherapy is of value in hemophilia, purpura and similar hemorrhagic affections. Clotting is produced by fibrin ferment elaborated by endothelial cells, which may be actively stimulated by the X-rays, when used in small or moderate doses which do not diminish the erythrocytes. Satisfactory results are obtained either by treating the spleen or by exposing large areas of the skin at a long focal distance.

Soresi (Med. Jour. and Rec., July 2, 1924) reduced the coagulation time in healthy dogs from an average of 8 to 10 minutes to a little more than 1 minute by purely mechanical means. The mere passage of a great amount of blood through a syringe sufficed to produce this result.

HEMORRHAGE.—Recalling Hofmeister and Neubauer's success with intramuscular injections of concentrated solutions of sodium citrate before operations, to prevent excessive hemorrhage, M. Renaud (Paris méd., Sept. 20, 1924) tried them in hemorrhages from cancer, intravenously. He injected from 15 to 30 c.c. of a fresh solution of 30 Gm. (1 ounce) of sodium citrate in 100 c.c. (3½ ounces) of water. The results were striking, the persistent bleeding ceasing after the first injection, in

some instances for 4 or 5 months. No hemorrhage from carcinoma has occurred in the hospital since this treatment has been in routine use. Its excellent effects were also manifest in the hemorrhages of hemoptysis, menorrhagia, hemorrhoids and other conditions, and its use is suggested in the hemorrhages of parturition and in metrorrhagia from fibroma. The shock which in some cases follows the injection is transient and never serious. Renaud regards sodium citrate as the most effective and reliable weapon at our command at present in the treatment of hemorrhage.

The experimental application of X-rays over the liver to prevent hemorrhage was tried by Shichida (Japan Med. World, May, 1924) and led him to conclude that it is an excellent method. He suggests that before operating on a patient with a hemorrhagic diathesis, the ray be used over the liver to avoid bleeding during and after operation.

According to Stegemann (Arch. f. klin. Chir., Jan. 27, 1923), transfusion of blood is the most certain and rapidly acting means of arresting parenchymatous hemorrhage and hemorrhage from small vessels. It supplies the lacking elements in the blood directly, and also stimulates indirectly their production. To arrest hemorrhage, small amounts, about 200 c.c., suffice.

HEMORRHOIDS.—Recalling a note to the same effect by H. W. Webber (Lancet, Aug. 9, 1924), Benham (*Ibid.*, Nov. 8, 1924) gives internally pix liquida (Stockholm tar) with an equal weight of powdered liquorice in 5-grain (0.3-Gm.) pills, 3 or more to be taken daily. He found this

agent almost invariably successful and the improvement so rapid that, as a rule, troublesome symptoms disappeared in a week or 10 days. As far as he knows, relapses and recurrences have not taken place and very few, if any, patients have later required an operation.

Bensaude (Bull. Soc. méd. des hôp. de Paris, May 11, 1923) found alcohol injections effective, but the patients having suffered severe pain, he prefers injections of 3 to 5 c.c. (48 to 80 minims) of 5 per cent. quinine and urea hydrochloride once a week, which he has used regularly for 3 years in the treatment of a large number of cases. The injections are made only in the submucous cellular tissue at the base of the hemorrhoid. They produce a local edema and later a fibrosis which hinders the venous circulation. Usually from 6 to 10 injections are required to produce results. In the event of pain about the anus, the injections are suspended, as the pain is due to a fissure or inflammation which must be relieved before continuing. In most cases the injections are painless, the solution having an anesthetic effect which persists for several days.

Internal hemorrhoids of the 2d and 3d degrees are treated by Pruitt (Med. Assoc. Jour. of Ga., Apr., 1923) by the injection of a solution composed of 95 per cent. phenol, 1 part; glycerin, 3 parts, and water, 4 parts. From 2 to 6 drops, according to the size of the hemorrhoid, are injected into the center of each tumor with a hypodermic syringe, using a sharp 24-gauge needle. But 2 tumors are injected at 1 time. One week should elapse before other tumors are injected. Although little pain

follows, there develops considerable swelling of the injected hemorrhoid. When the hemorrhoid is not very large, the patient may go about his work next day. But usually it is necessary for him to remain in bed for 1 to 3 days.

Piga and Freixinet (Rev. Ibero-Amer. de Med., Sept., 1924) relate that in over 20 of their 103 patients operative treatment did not afford permanent relief. Among the 103 treated by electrocoagulation, however, a definite cure is stated to have been obtained in nearly all.

Experience in 600 consecutive cases of hemorrhoids treated by the clamp and cautery method, in which P. Syms (Surg., Gyn. and Obst., Sept., 1924) had but 1 death—due to pneumonia from ether,—leads him to conclude that this method is the best and that it is safer than the injection, ligature, or any other method of operating.

Philipowicz (Jour. Amer. Med. Assoc., from Zent. f. Chir., June 16, 1923) recommends a simplified local anesthesia for operation in anal fissure and hemorrhoids which he has used with perfect satisfaction in over 100 cases. As anesthetic he employs the Schleich cocaine mixture. For stretching the sphincter, only 5 c.c. is required. The single puncture is made exactly in the posterior midline, 2 fingerbreadths from the anal margin. At this point, with a thin needle 6 cm. long, at first 1 drop is injected intradermally and then the balance is injected in part tangentially toward the sphincter and in it, and in part intracutaneously and subcutaneously toward the anal margin. Anesthesia is accomplished at once and is complete. For the cauterization of hemorrhoids, if the nodules are external or can be pressed out, he injects from 3 to 5 c.c. of the solution into each nodule in succession. Each nodule must be injected and cauterized before proceeding with the next. If the hemorrhoids are internal, the sphincter must be dilated, and the nodules are then injected and cauterized 1 by 1 as in the case of the external hemorrhoids.

### HERNIA.—DIAPHRAGMATIC.

-According to J. L. Crook (Med. Jour. and Rec., Jan. 2, 1924), wide divergence prevails as to the relative merits of approach when strangulation of a diaphragmatic hernia has occurred. In his opinion, the condition of the patient at the time he is first seen should determine largely the decision. Where symptoms of strangulation and ileus are apparent, the abdominal approach is an absolute necessity. Where the case is a chronic one, and the diagnosis has been clearly established and confirmed by X-ray before operation, the combined approach is indicated. The abdominal incision should be made first, and if reduction can be successfully performed, and access can be had to the rent in the diaphragm, it may not be necessary to open the chest. Binnie, who analyzed the relative mortality in 52 traumatic cases, found that in the non-strangulated cases the operative mortality of the thoracic route was 9.6 per cent., while that for the abdominal route was 50 per cent. When strangulation had occurred the mortality from the thoracic route was 50 per cent., and from the abdominal, 100 per cent.

FEMORAL.—E. Andrews (III. Med. Jour., Apr., 1923) describes an operation for femoral hernia intended to prevent the troublesome defects which follow operation for reduction when the ring is very large and rigid or when it has to be enlarged at operation. He closes the upper end of

the femoral canal with a strip of the aponeurosis of the external oblique muscle by turning it into the space and attaching it to the periosteum of the pubic bone just above the pectineal line. The upper fragment of the external oblique is sewed to Poupart's ligament. The advantages claimed for this method are: The closure of the canal is made at the upper end, leaving no pouch; a stronger membrane is used than in any other operation; the rigid and inelastic walls of the ring are not used, but instead, structures that can be sutured together without the slightest tension.

INGUINAL .- F. E. Adair (Jour. Amer. Med. Assoc., Feb. 23, 1924) urges the advantage of using the aponeurosis of the external oblique as a source of living suture in inguinal herniotomy, recalling the original method of Gallie and Le Mesurier which gave remarkable results. He presents a modification which renders unnecessary the creation of a new surgical wound to provide the sutures. His procedure is as follows: (1) All fat and subcutaneous tissues adhering to the external surface of the aponeurosis of the external oblique are carefully cleared away by scalpel and gauze dissection. This is done over an area 1 inch wide, extending from the external inguinal ring, upward and outward, for 5 to 6 inches. (2) The aponeurosis is split in the usual way, beginning at the external inguinal ring and continuing upward 5 or 6 inches, parallel with the fibers or "grain" of the aponeurosis. (3) The necessary number (usually about 2) of aponeurotic strips, ½ inch wide and 6 inches long, are cut for use as sutures. These strips are placed in moist gauze while the hernial sac is

being ligated and excised. The strips are now threaded through large-eyed Hagedorn needles. (4) The conjoined tendon is sutured to Poupart's ligament by using these aponeurotic strips as sutures.

The technic of sewing with such unusual suture material necessitates that there be a strict carrying out of the details. The major idea is to have good contact between Poupart's ligament, conjoined tendon and the strip of aponeurotic suture. The hernial repair is made according to the operation which the surgeon prefers to use, such as the Bassini, the Ferguson, or the Andrews.

As observed by K. Koch (Zent. f. Chir., Aug. 9, 1924), small, direct hernias may be associated with larger indirect hernias, the former being often overlooked at the operation. In a personal case there was, besides bilateral direct inguinal hernias, bilaterally a small indirect hernial sac, thus necessitating the removal of 4 hernial sacs.

W. Goldschmidt (Wien. klin. Woch., Nov. 6, 1924) recommends the Anschütz modification of Bassini's operation even in cases with adhesions. Isolation of the sac of the hernia becomes unnecessary. He opens and sutures it only at the neck. The modification is simpler than Bassini's original method, avoids injury of the spermatic cord and the testis, and has fewer recurrences.

In a report of 2468 operations by Coley for hernia, Hoguet (Surg., Gyn. and Obst., July, 1923) refers to 824 for inguinal hernia in patients under 15 years of both sexes, thus illustrating the wisdom of resorting to curative measures in *children*, instead of depending upon the truss. The

latter is used only in children under 3. The 824 operated cases did not suffer a single recurrence, nor any mortality. In the 963 operations in males over 15 years, the Bassini operation with transplantation of the cord was resorted to in the great majority of cases.

In a review of the indications as to the best operation to choose in difficult hernias, Tinker and H. B. Sutton (N. Y. State Jour. of Med., Aug., 1924) conclude that the Bassini operation with its modifications, such as transplanting the rectus muscle or sheath, gives a percentage of recurrences far too high, particularly in direct hernias and in oblique hernias in old persons. In such subjects it should be abandoned. When the fascial structures at the hernial site are good, the procedure of Andrews or some overlapping method may give better results, but McArthur's autoplastic sutures laced across the posterior wall of the lower 1/2 of the inguinal canal seem best. In bad direct hernias, old oblique hernias, all recurrent hernias and ventral hernias, Gallie's procedure gives the most promise. The routine use of local anesthesia, by eliminating postoperative vomiting and retching, reduces the number of recurrences.

Analyzing 264 cases of inguinal hernia operated by various surgeons during one year, J. C. Hubbard (Boston Med. and Surg. Jour., Mar. 27, 1924) states that of 206 patients operated on 1 side only, 25 became septic; of 58 double operations, 8 became septic. There appears, then, to be no greater chance of postoperative wound infection in the double cases than in the single. Of the 206 patients on whom the single operation was performed, 8 had pulmonary complications; in the 58 subjected to a double operation, 12

had such complications. It is best, therefore, to refuse to operate on both sides at 1 sitting in a case of double hernia, not so much for fear of local sepsis as of pulmonary complications.

VENTRAL.—Masson (Surg., Gyn. and Obst., July, 1923), of the Mayo Clinic, in discussing postoperative central hernia, deems most of the distressing results as due to faulty technic. But the majority follow sepsis, which is unavoidable in many cases, mainly owing to prolonged drainage, and, as secondary factors, paralytic ileus, vomiting, coughing and sneezing. In most cases the sufferer puts up with the deformity by wearing a belt or truss. Others submit to operation. Of 28,270 abdominal operations performed at the Mayo Clinic during the 5 years ending with 1919, 2.05 per cent. were for postoperative ventral hernia. Masson urges the importance in obese subjects of preoperative management, keeping them in bed on a restricted diet to reduce the blood-pressure. He found that such hernias tend to occur in low midline incisions, and in his experience, only where, after such incisions, infection had not occurred.

HERPES.—As stated by G. Mariani (Arch. f. Derm. u. Syph., cxlvii, 259, 1924) in an etiological and critical survey of the herpetic eruptions, beyond the fact that instillation of serum from the vesicles both of herpes zoster, febrilis and progenitalis into the rabbit's cornea is toxic and in some cases fatal to the animal, very little of the great mass of literature that has arisen around this important discovery on the Continent is generally known. It appears to be established that, among the large group of herpetic diseases in man and

the experimentally produced infections in animals, there are many types which deviate from the text-book descriptions. Mariani describes 4 subtypes: (1) Herpetic affections, mainly vesicular, with mixed epithelial and nerve affinities. (2) Vacciniform, of pustular tendency, and almost exclusively dermatotrophic. (3) Those examples of the disease in which the lesions somewhat resemble molluscum contagiosum, of proliferative and degenerative tendency, and mainly dermatotrophic. (4) A group in which the virus attacks the nervous system and may produce encephalitis. The epidermis is affected only occasionally and under artificial conditions. The virus itself appears to be ultra-microscopic and cell inclusions abound. The 3 main characteristics emphasized are neurodermotropism, filtrability of the virus, and cell inclusions.

Acute herpetic lesions of the central nervous system were specifically stained by R. H. McClellan and Goodpasture (Jour. of Med. Research, Dec., 1923) by intravenous injection of trypan blue, and the lesions rendered visible throughout their extent by subsequent fixation and clearing by the method of Spalteholz. The dye diffused throughout the lesions, staining dead and injured nerve cells and possible fibrin.

HERPES ZOSTER.—The connection between this disease and febrile herpes is suggested by a case reported by Bloch and Terris (C. r. Soc. de biol., May 30, 1924), in which the patient had herpes zoster preceded for 1 week by labial herpes. On inoculation into the cornea of rabbits, only the fluid from the labial herpes produced a keratitis. From a comprehensive study of this relation-

ship B. Lipschütz (Wien. klin. Woch., Jan. 15, 1924) concluded, from the etiologic standpoint, that zoster and febrile herpes are different infectious diseases. Hence he suggests that the former be called merely "zoster," dropping the "herpes."

Herpes zoster clinically and pathologically analogous to herpes zoster in man was produced experimentally by Teague and Goodpasture (Jour. of Med. Research, Dec., 1923) in guinea-pigs and rabbits. They inoculated the tarred skin of the animals. with the virus of herpes simplex. The intermediate forms of herpes in man, the eruption of which is definitely neural in distribution, are caused by a virus strongly pathogenic for rabbits. The virus from such a case produced typical experimental herpes zoster. The authors believe that herpes zoster in man is produced by a strain of virus differing from the virus of herpes simplex only in virulence, or by a virus related to that of herpes simplex.

Paralytic phenomena have been reported by various observers. In a case seen by W. Thalhimer (Arch. of Neurol. and Psych., July, 1924), which ended fatally 6 weeks after the onset, microscopic lesions found in the central nervous system were similar in some respects to the type of lesions present in the brain and spinal cord of patients dying from epidemic encephalitis or poliomyelitis.

TREATMENT.—The use of pituitary extract in this disorder is the outstanding newer feature to be added to those already published in the Cyclopedia and its Supplements. Vendel (Ugeskr. f. Laeger, Mar. 29, 1923) reports a series of 18 cases of

herpes zoster treated in the course of 8 years. He used for each alternate patient hypodermic injections of 1 c.c. or less of pituitrin, while the other patients received the usual treatment only. The results of the 2 methods of treatment were strikingly different. The patients receiving pituitrin were relieved of pain in a few hours and the eruption disappeared in a few days. In the other instances the disorder followed its usual course. Pituitrin was not employed in the presence of pregnancy or high blood-pressure, nor in aged patients. As some degree of malaise was experienced the patient was instructed to lie down for 15 or 20 minutes after the injection.

## HEXAMETHYLEN AMIN.-

A pharmacologic study of this agent by De Eds (Arch. of Int. Med., Oct., 1924) showed that its oral administration is futile, it being decomposed in the alimentary canal. Nor can its alleged effects be accounted for by the liberation of formal-dehyde in the circulation or tissues, the amount being too small. Its 1 field is pathologic conditions of the bladder, provided the urine be markedly acid.

According to G. von Takáts (Arch. f. klin. Chir., Sept. 22, 1923), however, hexamethylenamin, when given intravenously, inhibits bacterial action and kills bacteria by reason of the formaldehyde formed from it in the nascent state in the affected tissue through local acidosis. Injected in a 40 per cent. solution, the drug promotes exchange of water, salts and colloids between the blood and tissue fluids, encourages absorption and increases the amount of urine. Used intravenously in 500 cases, the drug began to be excreted in the urine in 10 to 15 minutes and this continued for 36 to 48 hours. Formaldehyde appeared in the urine in 5 to 10 minutes. The dose of the 40 per cent. solution was 10 c.c., administered daily for 10 to 12 days. No hematuria resulted, though there was some tenesmus. The disorders showing rapid

benefit from such injections were suppurative cholangitis, catarrhal jaundice from ascending cholangitis, recurrent spasms after gall-stone operations, postoperative bladder paralysis, obstinate furunculosis, and threatened general sepsis. In the lastmentioned cases the process is often checked by 1 or 2 injections.

In the rubber industry, according to H. J. Cronin (Jour. Amer. Med. Assoc., July 26, 1924), hexamethylenamin is scattered through the rubber during the mixing process in 0.1 per cent. strength. The drug poisoned 60 employees in a rubber factory, he reports. Acute dermatitis of the exposed surfaces was the principal symptom. Itching was extreme. Many patients later had indolent, deep infections that resisted treatment. Lotions and protective ointments were found to be of some value, while the infections were treated by poultices, incisions and drainage. All efforts to prevent the development of new cases were unsuccessful until elimination of hexamethylenamin from the rubber stock had become complete.

HEXYL RESORCINOL. -This compound, introduced in medicine by Veader Leonard (Jour. Amer. Med. Assoc., Dec., 20, 1924), results from the addition of 6 alkyl radicals to resorcinol, the bactericidal power of which is thereby increased by more than 15,000 per cent. Its phenol coefficient is 46.0. It is asserted to be the most powerful germicide ever described as a non-toxic substance. Indeed, the toxicity of the alkyl resorcinols, as each additional carbon atom group was added, was found to decrease as their bactericidal properties increased. Five men were given over 45 Gm. each of normal hexyl resorcinol over 6 weeks without any toxic effects or irritation of the urinary tract.

The crystals of the drug in enteric-coated capsules are administered for urinary antisepsis 3 times a day in doses of 0.33 to 1 or 2 Gm. (5 to 30 grains). Mild catharsis usually results. In urinary tract infections due to Staphylococcus albus, S. aureus, the streptococcus, and some strains of B. pyocyaneus, oral use of hexyl resorcinol (commercially available as caprokol), without other treatment, has resulted in prompt and complete disinfection of the urinary tract, with con-

sequent clearing of the urine and disappearance of symptoms. Colon bacillus infections have also cleared up completely under it, though, as described by Leonard (Jour. of Urol., Dec., 1924), this occurs only if the bacterial count in the urine is low; if it is high, the drug proves insufficient until the count has been brought down by local applications. Hexyl resorcinol retains its strong bactericidal action in urine of any reaction; sodium bicarbonate must not be combined with it. The bulk of each dose is excreted as an inert conjugate, otherwise much smaller doses could be used. It is not claimed to exert any appreciable influence on infections which have already invaded the parenchyma of the kidney. In the cases to which it is adapted, no recurrences were noted after the drug had been discontinued for several months.

HICCUP (SINGULTUS), SIM-PLE AND EPIDEMIC.—As described by J. Friedenwald and M. Levy (Med. Jour. and Rec., Feb. 6, 1924), the simple form of hiccup may be slight, but it may be grave and terminate in death. It is due to clonic spasm of the diaphragm, producing a sudden inspiratory movement with closure of the glottis, which thus acts as a hindrance to the entrance of air to complete the vacuum produced by the rapid lowering of this muscle. It is a type of modified respiration due to irritation of the vagus, often from the gastrointestinal tract. The vagi, when irritated, send out sensory impulses to the medullary centers, where they are reflexly transferred by way of the phrenics to the diaphragm. etiology of hiccup may be classified as (1) neurotic and unknown, (2) reflex, (3) infectious and toxic, (4) affections of the thoracic viscera, (5) affections of the abdominal viscera, and (6) cerebrospinal and other organic nervous diseases.

It would appear, however, that the pathogenesis of the disorder is not soundly established. Thus, Kappis (Klin. Woch., June 10, 1924), in a patient 27 years of age who had suffered for 3 years, found that bilateral phrenicotomy gave no relief and that even exeresis of the nerves caused no He holds, therefore, that the diaphragm takes no part in the production of the spasm and that the spasms are due to contractions of the accessory muscles. Hydrotherapy, narcotics, faradization, hypnosis, paravertebral injections of procaine at the level of the 5th cervical vertebra, extirpation of the whole left 4th cervical root and the lower and middle left sympathetic ganglion giving only transitory relief, the writer compressed the upper part of the thyroid cartilage, without choking the patient, but with such force that he could not hiccup. This measure arrested the spasms. It also helped in another patient.

Guillain, Alajouanine and Mathieu (Bull. Soc. méd. des hôp. de Paris, Jan. 25, 1924), report a case of hiccup which had persisted 15 months. The cerebrospinal fluid was found normal, but the hiccup stopped for 24 hours after lumbar puncture.

The *epidemic form* has prevailed in various parts of the American continent, though not in a dangerous form, and has seemed to some observers to occur as a manifestation of influenza and to others as concomitant with epidemic encephalitis.

Joltrain and Hutinel (Presse méd., Sept. 13, 1924) report a case of severe hiccup for a week in epidemic encephalitis. The hiccup seemed to depend on respiratory disturbances following intravenous injections of a preparation of mercury.

Nelken (Med. Klin., Oct. 26, 1924) cites 3 cases in which the patients died within a week from the onset. One of them had hypertension with contracted kidneys; another, syphilis of the brain; the 3d, tuberculosis of the lungs and colon.

Several cities experienced successive visitations. Thus, Winnipeg, Canada, according to Cadham (Jour. Amer. Med. Assoc., Feb. 21, 1925), had an epidemic of over 100 cases in 1919; a smaller outbreak in 1922, and a record one of 1400 cases in 1924, the latter wholly within a period of 6 weeks, followed 1 week later by an epidemic in an adjoining town. It presented no evidence of being due to contagien. The outbreaks all took place coincidently with the onset of winter, then declined rapidly. The great majority of cases were in adults and 90 per cent, in males. Race and environment had no influence on its development. In recurrences, the symptoms were less severe and of relatively short duration. An oval Streptococcus viridans was always found in the nasopharyngeal secretions, which fermented dextrose, lactose and maltose, and promptly on subcultivation.

> The streptococcus of epidemic hiccup was found by Rosenow (Jour. of Infect. Dis., Jan., 1923) to produce a complex of substances which on inoculation into animals caused spasms of the diaphragm, sometimes associated with tremor and twitchings of the masseters and other muscles. It is demonstrable in filtrates, in the clear centrifugalized broth, and in the washed dead bacteria of young cultures at the time the living streptococcus produces like symptoms in animals, and disappears from these as the living bacterium loses this power from artificial cultivation. The symptoms and lesions produced were essen

tially alike, except as to duration and extent, following injections of active filtrates, suspensions of dead bacteria, and the living organism. Hence, the specific localizing power, with the production of this highly characteristic syndrome, would seem to be due to a chemical substance produced either by the streptococcus or during the reaction incited in the host.

Each of the epidemics in Winnipeg was associated with common colds, the so-called "grip." In these, as in hiccup, practically all patients complained, as observed by Boyd (Editorial, Jour. Amer. Med. Assoc., Jan. 22, 1921) in encephalitis, of tenderness of the scalp, face and neck. The illness lasted from 2 to 6 days, with weakness as aftermath in many. The 1919 epidemic, however, coincided frankly with an epidemic of encephalitis. During the 1921 epidemic, 31 cases of encephalitis were also reported. During the 1922-23 epidemic of the latter disease, however, no hiccup cases were recorded.

The onset was sudden, often during sleep, the hiccups occurring at the rate of 4 to 20 a minute, then ceasing for a time, from a few minutes to 18 hours, then recurring. Some soreness of the abdominal and thoracic muscles, occipital headache, nausea and vomiting, slight difficulty of mastication and deglutition, hyperesthesia of the scalp, and concomitant or subsequent weakness were the more prominent symptoms observed. Congestion of the pharynx, rarely a mottled, dusky or cyanotic appearance of the skin, hyperesthesia of the face and neck, and myoclonic spasms of the rectus abdominis were also noted occasionally. The temperature, after an initial rise, became subnormal, vis., 97° F. The pulse was

slow, from 50 to 75, but the rhythm normal. Blood counts in 15 patients gave a polymorphonuclear leukocytosis averaging 10,000. No urinary changes were noted. The respirations were somewhat slowed in severe cases.

TREATMENT.—In the simple form Friedenwald and Levy (loc. cit.) deem it important to determine the cause. They found benzyl benzoate, in doses of 40 to 60 drops well diluted, at 2 or 3 hour intervals, of special value. Acting on the smooth muscle structures, it is most useful, hiccup being probably of peripheral origin. In the persistent hiccups, such as those complicating acute peritonitis and pancreatitis and following abdominal operations, opiates in the form of morphine or pantopon administered hypodermically and inhalations of chloroform are to be recommended. In certain aggravated cases, the writers were successful with galvanization to the neck.

Hishikawa (Schweiz. med. Woch., Apr. 10, 1924) recommends the ancient method of Eryximachos, that of inducing the sneezing reflex by irritation of the nasal mucosa with a feather or a piece of paper. Vomiting also cures hiccup. Both methods act by stretching the diaphragm.

In the *cpidemic form*, Cadham states that in the Winnipeg epidemic, benzyl benzoate found, among the host of sedatives tried, the greatest favor among physicians, and checked the spasms in some cases. Rest was also found of value. The disease, however, was, as a rule, self limited.

#### HIRSCHSPRUNG'S DISEASE.

-Behring and Klercker (Acta Pæd., Oct. 25, 1924) add a case to those on

record which showed the cause to be intestinal obstruction from *muscular spasm*. It occurred 14 cm. above the anal sphincter, a button being found above the contraction ring. Intestinal spasm, however, is not the only or even the most common cause of the syndrome; localized functional spasms may also act as cause.

In a case reported by E. Huber (Deut. Zeit. f. Chir., Mar., 1924), which occurred in a boy, aged 10 years, the whole large intestine was involved, and the entire colon was removed. The lower ileum was united with the upper rectum. The result was excellent, no harmful sequels occurring. During 15 months elapsed after operation the boy developed normally.

# HODGKIN'S DISEASE

(Lymphogranulomatosis Perniciosa). -W. S. Lenion (Amer. Jour. Med. Sci., Feb., 1924) studied the histories of 191 cases and, contrary to a prevailing view concerning the frequency of tuberculosis as a cause, found only 8 in the series in which evidences of tuberculosis could be discovered by means of Roentgenograms of the chest. Conversely, a like number (191) of unselected cases, when examined in the same way, revealed evidence of tuberculosis in 17 instances. This would tend to show that tuberculous involvement of the mediastinal glands is not so common in Hodgkin's disease as in other disorders.

Pancoast and Pendergrass (Amer. Jour. Med. Sci., Sept., 1924) observed 4 cases of herpes zoster occurring in Hodgkin's disease. One patient died, the zoster occurring rather late in the affection. In 4 cases still under observation, the zoster occurred rather

early in the disease in 3 and late in the other. Seemingly, the severity of the disease had nothing to do with the eruption, but the herpes was probably due to irritation caused by the mass of glandular enlargement in close proximity to the ganglion.

Paraplegia and cauda equina symptoms were observed in Hodgkin's disease by F. P. Weber (Quart. Jour. of Med., Oct., 1923) in a boy of 19 years. He refers to 4 other similar cases in literature.

In a series of 18 cases, McAlpin (Arch. of Internal Med., Dec., 1923) found that it would not have been possible to diagnose the disease from examination of the blood, as Bunting Only 8 cases has claimed to do. showed an increase in the transitionals, whereas Bunting believed there was an absolute increase of these cells. The highest total white count was 13,000. Nor was there an apparent relation of the total white count to the duration of the disease. If 300,000 be regarded as approximately a normal platelet count, only 7 in the series had high counts. Bunting, from a study of smears, pointed to a constant increase in platelet count. McAlpin holds that estimating the platelets from an examination of the smear alone is not accurate; he counts them in a counting chamber. Treated patients show more high platelet and transitional counts than untreated ones.

TREATMENT.—Desjardins and F. A. Ford (Jour. Amer. Med. Assoc., Sept. 15, 1923) studied the histories of all patients entering the Mayo Clinic between 1915 and 1920 in whom a definite diagnosis of Hodgkin's disease or lymphosarcoma had been made by microscopic examination of excised glands. The purpose was to determine the average dura-

tion of the disease in the 2 groups of patients and the relative value of systematic and X-ray treatment. There were 135 cases of Hodgkin's disease, of which 92 could be traced; of these patients 10 were living and 82, dead. There were 102 with lymphosarcoma; of these 76 could be traced; 9 were living and 67, dead. The data indicate that men are 2.3 times more susceptible to Hodgkin's disease than women, while lymphosarcoma attacks men 4.4 times more often than it does women. The period of greatest susceptibility to Hodgkin's disease is during the 2d, 3d, 4th and 5th decades, with strong emphasis on the 3d and 4th. Lymphosarcoma is most prevalent during the 3d, 4th, 5th, 6th and 7th decades, particularly the 5th and 6th. There is a close similarity in the symptoms of these 2 conditions. The average duration of Hodgkin's disease in 73 cases was 2 years and 7 months; in 55 cases of lymphosarcoma, it was 2 years and 5½ months. Of the patients with Hodgkin's disease only 9.8 per cent. lived more than 5 years; of those with lymphosarcoma 11 per cent. were alive at the end of this period. While it was not possible to show that systematic treatment by X-rays definitely prolonged life, such treatment kept the disease under complete or partial control for varying periods; in the present state of our knowledge it is the most effective means of affording relief in these conditions.

According to Béclère (Bull. Soc. de radiol. méd. de France, July, 1924), during the course of malignant granulomatosis, outside of its usual manifestations in connection with the lymphopoietic organs and even after their entire disappearance fol-

lowing Roentgen therapy, other visceral or osseous localizations may supervene which form an integral part of the disease. The bony lesion's sometimes excite functional symptoms which lead to their discovery; they are sometimes latent and must be sought by a very careful X-ray examination. They must not be confused with osseous tuberculosis or with true bone neoplasms, which they resemble. They are amenable to X-ray therapy, methodically applied, but a definite cure of the disease is not always obtained.

Klewitz and Lullies' (Klin. Woch., Feb. 12, 1924) 16 patients who had been treated with X-rays lived on an average 20 months after the beginning of the disease. Thus it seems that the treatment did not prolong life. Only 1 survived for 6 years.

**HOOKWORM DISEASE (AN-**KYLOSTOMIASIS).— Ackert and Payne (Amer. Jour. of Hyg., Jan., 1923) found that the custom of covering human waste with 2 inches or less of clay loam is unsuccessful as a control measure against hookworm disease. The results of tests made by Ackert in which hookworm eggs in soil pollution were buried under 4 inches and under 5½ inches of clay loam showed that the eggs produced infective larvæ, that the larvæ migrated to the upper part of the culture, and that the eggs remained viable for 58 days. The custom of covering soil pollutions containing hookworm eggs with a thin layer of wood or charcoal ashes is also ineffective, as large numbers of infective larvæ developed in stools wholly surrounded by the ashes. The larvæ lived deep in the cultures for over 3 weeks.

TREATMENT.—Administered in 3-c.c. (48-minim) doses to adults, carbon tetrachloride was found by Smillie and Pessoa (Amer. Jour. of Hyg., Jan., 1923) an extremely efficient drug. A single treatment will remove more than 95 per cent. of all hookworms. Larger doses are unnecessary and may be dangerous. Carbon tetrachloride has a toxic action on the host, similar to that of chloroform. The first stages are dizziness, slight nausea, headache, and somnolence. These are usually transient. A later and more serious manifestation is fatty degeneration of the liver, which first manifests itself 2 or 3 days after treatment. This condition rarely occurs and is seldom fatal. There is a wide variation in individual reaction to carbon tetrachloride. Large doses, from 10 to 20 c.c.  $(2\frac{1}{2}$  to 5 drams), have been given to adults without producing apparent ill effects. Alcoholics are especially susceptible to the toxic action of the drug; so small a dose as 1.5 c.c. (24 minims) has produced severe toxic symptoms in them.

Cooper and Vadala (Milit. Surg., Feb., 1923) found that a single dose of carbon tetrachloride gave 100 per cent. of cures. The drug was administered in soft gelatin capsules each containing 1 c.c. (16 minims) and was given in the mornings, preferably without breakfast.

Garcia's experience (Rev. de Ciencias Med., Aug., 1924) with 71 cases confirmed the efficacy of carbon tetrachloride. It acts also on the trichocephalus, but not so constantly or vigorously as on the necator, unless larger doses are given. Some patients under treatment are taking 6 c.c. daily to expel the trichocephalus.

Oil of chenopodium, 3 c.c. (48 minims) in 1 dose, has been used with good results, but these do not approach the proportion of cures obtained from carbon tetrachloride.

**HYDATID CYST.** — By injecting intradermally 0.5 c.c. (8 minims) of the fluid from a bovine hydatid cyst (or 1 c.c.-16 minims-from a human source), Mogena (Archivos Esp. de Enf. del Aparato Digestivo, June, 1924) obtained a positive reaction in all his 14 cases of hydatid cyst confirmed by operation. Eosinophilia was present in only about 54 per cent. and the Weinberg test was positive in only about 73 per cent. Thiellé (Arch. de l'Inst. Pasteur de Tunis, Dec., 1923), however, states that in her extensive experience with the Weinberg method, she has never obtained a positive response in the absence of echinococcus infection. The fluid should not be heated. Fluid from a human cyst or a cyst in a hog is more active than from cysts in cattle.

**HYDROCELE.** — According Lisbonne (Presse méd., Oct. 11, 1924), a reaction occurs in mixing hydrocele fluid with chloroform, making it possible to determine its cause. The hydrocele always proved to be of an essential or primary nature when the fluid did not coagulate after prolonged contact with chloroform. Conversely, the coagulation was rapid, in from 5 to 30 minutes, when the hydrocele was of syphilitic, tuberculous or cancerous nature. The coagulation was slow, 4 to 6 hours, if a pachyvaginalitis was responsible for the condition.

In a case described by B. A. Thomas and D. C. Thompson (Jour. of Urol.,

Sept., 1924) 4 hydroceles were present at the same time—a hydrocele of the tunica vaginalis and a hydrocele of the epididymis on each side, the latter being entirely distinct from the former. The sac walls and their fluid content and their relationship to the testis and epididymis were identical on both sides, except that both hydroceles on the left side were about twice as large as those on the right.

TREATMENT.—Bazy (Bull. de l'Acad. de méd., June 24, 1924) highly recommends, in hydrocele of the tunica vaginalis, injection of from 30 to 60 c.c. (1 to 2 ounces) of tincture of iodine after cocaine and removal of the fluid by puncture. The result is a permanent cure. The method is contraindicated in a congenital hydrocele which communicates with the peritoneum, in Dupuytren's hydrocele, and in hydrocele with thick walls.

Rheins (Med. Klin., July 27, 1924) confirms the good results of injection of from 5 to 12 Gm. (1¼ to 3 drams) of tincture of iodine. A preliminary morphine injection is advisable in some patients.

HYDROCEPHALUS. -DIA-GNOSIS.—In an effort to establish an outlet for the relief of an acute internal hydrocephalus, Fay and Grant (Jour. Amer. Med. Assoc., Feb. 17, 1923) established an opening through the thinned cortex, deeming this a far safer procedure than the midline approach between the hemispheres. Acute hydrocephalus occurs not infrequently in meningitis and possibly as a result of trauma at birth. Dandy, in 1922, employed ventriculoscopy, ic., examination of the ventricle to determine the pathologic condition present, but the authors, in addition, employed photography. The procedures proved feasible, with little risk and reaction. In a case described, clear fluid escaped under considerable pressure, affording relief and mental improvement. Bókay (Monats. f. Kind., Mar. 25, 1923) recommends Strassburger's method for determining the distribution of the fluid in the cerebral ventricles in hydrocephalus by transillumination.

In a case observed by Fracassi (Rev. Med. de Rosario, Apr., 1923), hydrocephalus developed in a young man 4 years after a contusion of the chest. Frontal headache and impairment of vision of sudden onset, with normal spinal fluid, called for a decompression operation, which was followed by gradual improvement.

A case of unilateral internal hydrocephalus was observed in a man of 62 by Winkelman and Eckel (Arch. of Neurol. and Psych., Aug., 1924). It cannot be diagnosed with certainty, but may be suspected in older subjects when repeated strokes occur on the same side or a slowly progressive hemiplegia with convulsions and mental deterioration appears where other conditions, such as brain tumor, etc., can be ruled out. Dandy showed that unilateral hydrocephalus can occur from obstruction at the foramen of Monro, and also as a result of arteriosclerotic or encephalic lesions in the

TREATMENT.—Marriott (Amer. Jour. Dis. of Childr., Oct., 1924) recommends theobromine sodiosalicylate (diuretin) in the communicating type, but not where complete obstruction exists. It acts by increasing the surface tension. He gave 0.2 Gm. (3 grains) 3 times a day during a prolonged period. The circumference of the head decreased in several cases and increased when the drug was stopped. It also favors recovery when there is a tendency to spontaneous cure, as is occasionally ob-

served. On the suggestion of Prof. Blackader that the benefit might be due to the diuretic action of the remedy, Marriott stated that recent labors had indicated that theobromine did not influence the kidneys.

In a study of the various surgical technics, Koljubakin (Arch. f. klin. Chir., exxviii, 151, 1924) found that Küttner and Wenglowsky's method proved the most reliable. This consists in an autoplastic internal drainage with a little tube made from the patient's dura mater. For the purpose of differentiating hydrocephalus from obstruction, hypersecretion or defective absorption, Frazier's testinjection of 1 c.c. of phenolsulphonephthalein into the brain ventricle, and observing whether or not the dye appears in the spinal fluid-is recommended.

**HYPERTRICHOSIS.**—According to W. Weller (Med. Jour. and Rec., June 4, 1924), the present tendency of overbeautifying the complexion is the direct cause of the noticeable increase in facial hypertrichosis. In its treatment, attempts at removal with the razor, wonderstone or pumice depilatories, shoemaker's wax, etc., are to be condemned. Electrolysis is too tedious, painful and uncertain. The application of X-rays, as advocated by Schiff and Freud, of Vienna, has been abandoned as too dangerous on account of its many and varied wave lengths. A method has been devised by Geyser that is at once safe, sure and permanent, by which only the shortest wave lengths of X-rays are selected by means of a magnetic wave selector. As a rule, the area is exposed once every 2 weeks and 3 to 5 exposures cause the hair shafts to become loosened from the papillæ. After 3 more exposures the papillæ is, as a rule, not only atrophied but completely absorbed. From such a papillæ a hair can never again grow. Over 10,000 cases have been treated by this method, and the results have been such that he urges its general adoption. Where former X-ray treatment had resulted in wrinkling and drying of the skin, a practically normal appearance was eventually regained.

L. K. McCafferty (N. Y. Med., Jour., Dec. 5, 1923) advocates the electrolytic treatment. The needle should be extremely fine and pointed. The electrode, which is the positive pole, may be about 3 in. square, and is covered with wet absorbent cotton. The needle-holder is invariably attached to the negative pole. The needle should be placed directly into the follicular mouth, following the hair follicle to a depth varying from  $\frac{1}{16}$  to  $\frac{3}{16}$  in. If the needle is properly inserted, a white foam or froth exudes from the hair follicle. While the needle is still in place, the hair is removed with the slightest traction. A few minutes after the hair has been lifted from the follicle, a tiny brown halo appears, showing that destruction has occurred. The scab generally falls within a week, leaving a brownish red pigmented spot. The pigmentation fades completely in 3 to 6 weeks, leaving in some cases a barely noticeable white scar, whereas in other cases no visible trace is left.

HYSTERIA.—According to Sjöbring (Acta med. scand., Oct. 4, 1923), the war showed that even maximum strain cannot give rise to hysteria in perfectly normal persons.

Only those who have already manifested obvious signs of nervous instability develop it under the strain of war conditions. It was also shown that defective nervous constitution, psychic trauma or shock is not alone sufficient to cause hysteria. Among prisoners and the seriously wounded, there was practically no hysteria, whereas it was widespread among combatants faced with the prospect of continued active service. The hysteric symptom develops in the line of personal interest of the individual. This point has been emphasized by Freud as characteristic of hysteria. But the "wish-direction" is a feature common to all normal psychic activity; we are constantly striving toward pleasure and away from pain. The hysteric changes his personality from moment to moment and from situation to situation; hence his reputation for capriciousness and inconstancy. This mobility of mind forms the foundation of several bad moral traits such as lying, vacillation and unreliability, which lead to crimes.

According to Engelen (Münch. med. Woch., Jan. 16, 1925), Sahli's theory of hysteria as caused by functional lesions of anatomically distinct parts of the brain explains the fact that hysterical patients produced symptoms resembling epidemic encephalitis long before the latter disease was known to neurologists.

Hysteria is regarded by Kahn (Bull. méd., xxxvii, 363, 1923) as a psychopathy characterized by 3 functional disturbances: Morbid suggestibility; hyperemotivity linked to excessive excitability of the sympathetic system, rendering possible organic trophic lesions as a consequence of emotional trauma, and an instinctive preference for imagined falsehoods as against true facts.

Yealland (Lancet, Sept. 15, 1923) has seen hysterical fits reproduced when the patient attempted to raise the lower limbs against passive resistance. On command they always followed a certain state of tone of the muscles, created by simultaneous contraction of agonists and antagonists. Clonic-like movements occur in many neurasthenic individuals subjected to the same test, and in them there is the same distressed facial expression. This test appears to be of considerable diagnostic value.

Henner (Casop. lek. cesk., Feb. 17, 1923) defines as the "tight-rope gait," observed in several hysteric patients, a peculiar way of walking, the heel of 1 foot being placed in front of the toe of the other, and the steps faltering. Conversely, persons with organic disturbance impairing the gait usually walk with the feet well separated to maintain their balance.

To ascertain the nature of globus hystericus or "ball in the throat" and learn whether the feeling was due to the walls of the esophagus meeting in slight spasm and thus pressing on each other, E. Jacobson (Jour. Amer. Med. Assoc., Sept. 20, 1924)

employed the X-ray in patients who had swallowed a thick barium paste. He found that globus is essentially a spastic phenomenon of a paresthetic nature. The walls of the esophagus, meeting in spasm, feel somewhat like a bolus of food and suggest to the patient the experience of a foreign body.

TREATMENT.—In a case with spasmodic quadriplegia, contractures and hysterical trismus of 5 years' duration, L. J. Foster (Jour. Mich. State Med. Soc., July, 1923) employed psychotherapy with strict isolation and persuasion and a daily treatment with static electricity to reinforce the suggestion. Two weeks after the beginning of treatment the hands were held open and the arms could be moved in any direction. She could also flex the legs at the knees and was able to masticate. After another 2 weeks she was able to walk, but with a markedly hysterical gait. She continued to improve and was soon able to walk up and down stairs. Two months after her entrance she was discharged well and walking normally.

I

ICHTHYOSIS.—A series of investigations in 21 cases in which the basal metabolism was ascertained led Krogh and With (Ugeskr. f. Laeger, May 17, 1923) to recognize a relation between ichthyosis and hypofunctioning of the thyroid gland. Thyroid preparations favorably affected this disease when the basal metabolism was below normal, but unfavorably as soon as the normal was reached. Salvioli (Riv. di clin. ped.,

Jan., 1925) reports a case of ichthyosis transmitted to the males by mothers who did not have ichthyosis. Thyroid extract ameliorated the condition.

IDIOCY.—AMAUROTIC FAM-ILY IDIOCY.—In reporting 4 cases observed by him, Duarte Salcedo (Med. Ibera, Jan. 3, 1924) states that intermarriage in certain communities causes this condition to be comparatively frequent in Spain. The parents in 2 of his cases were closely related.

A case observed by Hassin (Arch. of Neurol. and Psych., Dec., 1924) seemed to justify the opinion that the disease is essentially a developmental anomaly, the ganglion cells being defective in their growth and insufficiently supplied with the chromatophilic or Nissl substance. The cells also showed more or less marked degenerative phenomena. Both the developmental and the degenerative stigmata were especially marked in the optic thalamus.

MONGOLIAN IDIOCY OR MONGOLISM.—DIAGNOSIS.—A study of the X-ray findings by Clift (Amer. Jour. of Roentgenol., July, 1922) showed that the only characteristic feature is the disproportionate developmental deficiency of the nose and maxilla. The changes in the sella turcica were far from uniform. According to Mebane (Amer. Jour. Dis. of Childr., Oct., 1924), the presence of Hutchinson's teeth in mongolism does not indicate congenital syphilis. In 155 cases, the Wassermann test on the blood was performed routinely, but in not a single case was it found to be positive.

ETIOLOGY.—Very little evidence was found by D. M. Berry (Brit. Jour. of Childr. Dis., Oct.-Dec., 1924) in support of the pre-war theory that mongolism was due to the mother reaching the end of the childbearing period. In  $\frac{2}{3}$  of the cases the father had served in the army or navy in the war, and in nearly  $\frac{1}{2}$  he had suffered from shell shock, while the mothers were young and healthy.

X-ray treatment of a uterine fibroid at the outset of pregnancy appeared as

a possible cause in a case observed by Apert and Kermorgant (Presse méd., Dec. 5, 1923). Halbertsma (Amer. Jour. Dis. of Childr., May, 1923) concluded, after an analysis of 15 cases in 1 of twin children, that mongolism is germinal in origin, rather than acquired during embryonal life, i.e., due to defects in the germ plasma. Crookshank ("The Mongol in our Midst," 1924) • maintains that the older theory of Langdon-Down (1866)—that of an ethnic classification of imbeciles, recognizing a common descent of man, apes and imbeciles-is worthy of close investigation. The close resemblance to certain apes is emphasized by photographs. In a case observed by Sajous, the resemblance to a young chimpanzee was striking.

Although mongolism has been thought to be limited to the Caucasian race, A. Bleyer (Jour. Amer. Med. Assoc., Apr. 4, 1925) observed 2 instances in negro girls and refers to a case observed by Tumpeer (Jour. Amer. Med. Assoc., July 1, 1922) in a Chinese boy. A. Strauch (Jour. Amer. Med. Assoc., Dec. 29, 1923) observed 2 cases in twins, a rare occurrence.

PATHOLOGY.—In a study of 150 cases of mongolism by Brushfield (Brit. Jour. of Childr. Dis., Oct.-Dec., 1924), there were a few cases which were examined postmortem.

A patent foramen ovale was found in 7 out of 8 hearts—4 with a plain circular opening, 3 with a valve-like opening. The brain showed reduction in number and simplicity of the convolutions; no secondary convolutions; shallow sulci; cerebellum small and more exposed. All the brains were symmetrical; there were no changes in the pia or dura; the lateral ventricles were normal.

In a pathological study of 3 fatal cases by E. Thomas and Delhougne (Monats. f. Kind., Sept., 1924), no histologic changes were found, while

the content of iodine in the thyroid was normal. A retarded ossification of the skull existed in 2 instances.

TREATMENT.—In the treatment of Mongolian idiots, Comby (Monde méd., Apr. 15, 1925) emphasizes the importance of increasing their resistance to cold, to which they are peculiarly susceptible, by frictions, warm hydrotherapy, and warm clothing. Out of door life in the sun is also helpful. As they are liable to infections, precautions should be taken in this respect. Manual training, gardening, etc., are readily acquired, but school work is usually wasted. Of the remedies, the best are thyroid gland, 0.02 to 0.05 Gm.  $(\frac{1}{3}$  to  $\frac{3}{4}$  grains) according to the age, with suprarenal gland, 0.05 to 0.1 Gm. (\frac{3}{4} to 1\frac{1}{2} grains) before breakfast, 1 week in 2. In the intervening week glycerophosphate of lime should be given, and in the winter, codliver oil, if it is well borne.

INDICANURIA.—Studies in guineapigs enabled Distaso (C. r. Soc. de biol., June 20, 1924) to demonstrate that indican is present in the urine only when the colon bacillus is present in the feces. Indicanuria was found by R. M. Gordon (Ann. of Trop. Med., Dec. 21, 1923) in about 25 per cent. of apparently normal persons. It was present in 94 per cent. of amebic dysentery cases, but indican was absent from the urine of 5 cases of bacillary dysentery.

Krone and McCaw (Brit. Jour. of Dermat. and Syph., Nov., 1924), in a study of indicanuria in 146 dermatologic patients, found that 97 per cent. showed indicanuria on admission, while almost all showed a return to normal before discharge. The only connection suggested was between the extent of the eruption and the degree of indicanuria. Constipation did not appear to influence the indicanuria.

**INFANT FEEDING.**—BREAST **FEEDING.**—As emphasized by Jewesbury (Arch. of Ped., Feb., 1923), the excessive

advertising of patent foods and dried milks is responsible for a large part of the neglect of breast feeding. The mother who reads these advertisements gains the impression that natural feeding is unnecessary. This erroneous idea leads to the artificial feeding of many infants who should have been breast fed. The normal infant may tolerate even unsuitable artificial feeding, but he is apt to present later disturbances due to the faulty diet, and the delicate child is definitely injured by the improper feeding. Failure to nurse may be due not only to ignorance on the part of the mother, but also to lack of knowledge on the part of physicians and nurses. This is evident from the great decrease in the infant mortality rate since the institution of infant welfare centers under the guidance of trained physicians and dietitians. Probably 95 per cent. of mothers are able to nurse their infants wholly or partially. In the remainder, the contraindications are: (1) Active pulmonary tuberculosis on the part of the mother; (2) any wasting disease, and (3) pregnancy.

As regards the influence of breast feeding on infant mortality, a comprehensive study by F. L. McKay (N. Y. State Jour. of Med., Mar. 28, 1924), based on over 26,000 infants in various states, led her to conclude as follows: The mortality rate among artificially fed infants is in all instances at least 3 to 5 times as high as among breast fed. Among artificially fed infants it is also higher than in those partially breast fed. Among the partially breast fed, it is higher than among the breast fed up to the 8th month. longer the period of breast feeding the lower the infant mortality, and the longer the period of artificial feeding the higher the infant mortality rate. Mortality rates are higher for all causes of death among the artificially fed than among the breast fed and much higher for gastroenteritis and respiratory diseases. A few findings indicate a lessened morbidity among breast fed babies. The prevalence and duration of breast feeding varies from 96 per cent. in the 1st month to 72 per cent, in the 9th month, where intensive effort was made. The many reasons for weaning given indicate that in a large number of cases it is unnecessary. The author rightly urges that "every physician should be stimulated to make breast feeding universal in his own practice."

During the convalescence of infants, according to Park (N. Y. State Jour. of Med., Nov., 1924), breast milk is deficient for the process of repair. After wasting illnesses infants may not gain for long periods if fed only breast milk, but will gain at once if cow's milk protein is added to the breast milk feedings or mixed feeding is begun. The same phenomenon is sometimes observed in premature infants who fail to gain on breast milk alone but gain on combinations of breast milk and cow's milk feedings. The reason seems to be that the protein and salts in breast milk are not adequate to meet the abnormal requirements of convalescence.

Marfan, Turquety and Aris (Paris méd., Nov. 1, 1924) recommend buttermilk as the best bottle food for weak infants during the first months of life, or where there is insufficient breast feeding. Buttermilk prevents digestive disturbances and wards off malnutrition.

During maternal illnesses the continuation of breast feeding varies with the nature of the affection. Runge and Lauer (Deut. med. Woch., May 9, 1924) continue nursing in puerperal affections, but as the quantity of milk decreases, mixed feeding has to be used in addition. Only in puerperal sepsis is breast feeding suspended. Tuberculosis of the mother is a strict contraindication for nursing.

M. Hesse (Wien, klin, Woch., May 8, 1924) is strongly opposed to breast nursing of apparently healthy children by syphilitic mothers. The mother might transmit the disease and a wet nurse get infected from the baby if it should prove syphilitic.

Buttenwieser and Bodenheimer (Deut. med. Woch., May 9, 1924) observed toxic symptoms in a 17 days' old baby, nursed by its mother who had been poisoned by mushrooms (Amanita phalloides). Experiments on guinea-pigs made the transmission of the poison by the milk very probable.

The calcium content of breast milk was studied quantitatively by DeBuys and von Meysenbug (Amer. Jour. Dis. of Childr., May, 1924). They found the average of "normal" milks to be 32.6 mgm. per 100

c.c., with extremes of from 23.7 to 40.0 mgm. The "rachitic" milks averaged 27.5 mgm., with extremes of from 18.4 to 39.6 mgm. When milks were grouped according to the age of the infant, the calcium content decreased as lactation progressed. The calcium content of milk from the white race was higher than that of the colored race.

C. C. Wang and L. H. Davis (Amer. Jour. Dis. of Childr., June, 1924) studied the effects of the change of diet from breast milk to cow's milk in an infant. It was invariably followed by an increase in the chloride excretion in both feces and urine, and vice versa. The utilization of chlorides ran parallel to the urinary chloride. Change of milk had no effect on the chloride content of the blood.

ARTIFICIAL FEEDING .-- M. M. Burgess (Lancet, Jan. 17, 1925) has shown that, however scientific the theory that the formula of a baby's feeding should closely simulate human milk may be, it often fails in practice, particularly in the abnormal baby. Considerable experience in percentage feeding has shown him that there is something more in human milk than is expressed in its percentage formula and caloric value, and that much harm may be done until a fat is found that can be tolerated by the infant. The so-called Truby King method has not been shown to be the best for breast milk. Thus: (a) In the case of many babies sent out in good health, resort had to be had to breast milk to keep them in this state. (b) The gain in weight and general improvement 1st obtained was lost, and the total gain was less than would otherwise have been obtained. (c) Some babies actually suffered in consequence of the treatment.

C. E. Bloch's (Amer. Jour. Dis. of Childr., Feb., 1924) researches confirmed anew the enormous importance of milk as food for a child. By employing milk, and especially cream and butter, in the diet, not only was xerophthalmia cured, but growth and development were promoted, and the cure of the most prevalent infectious diseases was advanced.

Hintze (Med. Klin., Nov. 11, 1923) holds that proteins are not as important as the total caloric value of the food. Fat is to be preferred to proteins.

According to W. McK. Marriott and L. T. Davidson (Jour. Amer. Med. Assoc., Dec. 15, 1923), cow's milk is made more digestible by addition of acid, and can then be given to infants in considerably larger amounts. To prepare acid milk, a good grade of cow's milk is 1st sterilized by boiling for 5 minutes, then cooled and the scum removed. Lactic acid, U. S. P., 1 dram (4 c.c.) to each pint of milk, is then dropped in slowly while the milk is gently stirred. A smooth, homogeneous preparation should result, which keeps well even if not placed in a refrigerator, bacterial growth being almost completely inhibited. In the feeding, dilution is not usually necessary. Carbohydratepreferably Karo corn syrup-should be stirred into the lactic acid milk, since the amount of sugar present is insufficient for the average infant. The entire day's feedings are made up at 1 time and kept cool until used. A mixture of corn syrup, 1 ounce, with lactic acid milk, 1 pint, may be used satisfactorily throughout the 1st year. The infant is given about as much as he desires every 4 hours. Good results were obtained in sick infants.

As a food which, in quantity and in the correlation of fat, protein and carbohydrate, more nearly simulates breast milk than any other mixture, H. M. Greenwald (Arch. of Ped., Dec., 1923) commends the butter-flour mixture of Czerny and Kleinschmidt. In its preparation, 70 Gm. of butter are heated in a pan over a gentle flame until foaming takes place and the odor of fatty acids has disappeared (3 to 5 minutes); 70 Gm. of flour are then added and the mixture again heated, with constant stirring, until the mass becomes thin and takes on a brownish color (4 to 5 minutes); 1 liter of water is then slowly added, and finally 50 Gm. of cane sugar. The mixture is boiled and rubbed through a fine sieve. The required amount of it can be added to the desired amount of milk, previously boiled and cooled, and the whole kept cool until needed. The butter-flour mixture permits the giving of fat without the production of the disturbances otherwise frequently observed. It may be used: (1) As artificial nourishment for the healthy infant, a total of fluid not in excess of that taken by a breast-fed child being given; (2) in children with eczema, recurrent nasopharyngitis or rhinitis, chronic bronchitis, etc.; (3) in premature infants who must have an artificial diet; (4) in atrophic infants; (5) in spasmophilia; (6) in the period of reparation following acute diarrheal disturbances. It should never be used in acute cases of diarrhea with fever and loss of weight.

As an aid in changing from milk feedings to a varied diet, F. Wiltschke (Arch. f. Kind., Dec. 18, 1923) advocates a calves' marrow soup, prepared by cooking 5 Gm. (75 grains) of wheat grits in 100 c.c. (31/3 ounces) of water with a little salt and adding 5 Gm. of calves' marrow. The preparation is sweetened with saccharin. Its protein content is 0.62 per cent. and its nutritive value is 45 calories per 100 Gm.

NUTRITIONAL DISORDERS OF INFANTS.—From a study of the results of nutritional disturbances in 121 autopsies Stephani (Jahrb. f. Kind., Mar., 1923) concludes that in the acute forms there is always severe fatty degeneration of the liver and loss of fat in the adrenal cortex, while chronic forms are characterized only by deposits of hemosiderin in the liver and spleen.

On feeding infants alternately with milk from cows fed on green fodder and cows fed on dry fodder, Reyber (Berl. klin. Woch., Feb. 5, 1924) found that the latter immediately arrested the gain in weight. He attributes spasmogenic disturbances to lack of vitamin B, and the scorbutic disorders—by far the most frequent—to deficiency of vitamin C. None could be traced to lack of vitamin A. Vulnerability to infection or toxicosis he thinks due to lack of vitamins B or C. Treatment based on this interpretation, e.g., lemon juice in diarrhea, was always successful.

Schaps (Jahrb. f. Kind., Apr., 1923) found that the daily addition of 2 or 3 Gm. (30 to 45 minims) of lactic acid (divided in 5 or 6 doses) arrested dyspepsia, whether fermentative or putrefactive, in a very few days. Severe habitual vomiting and nutritional intoxication disappeared in a day if 10 to 20 Gm. (2½ to 5 drams) of gelatin were given in a liter (quart) of water in divided doses daily.

INFANTILE SCURVY.—A. F. Hess and M. Weinstock (Jour. Amer. Med. Assoc., Mar. 22, 1924)

found experimentally that the catalytic action of even minute doses of copper sufficed for the destruction of vitamin C in milk. The importance of this lies in the fact that copper equipment for the pasteurization of milk, if not in good repair or well cared for, deprives the milk of its vitamin C. This applies also to preparation of condensed milk.

E. Rousseau (Nourrisson, July, 1923) recalls that vitamin C is the most sensitive of all vitamins to the action of oxygen, heat and cold. All substances containing vitamin C, even lemon prepared in a vacuum, lose it on standing. Marfan declared that all condensed milk cans should be dated, and Rousseau's research indicates that no such milks should be used for infant feeding if prepared longer than a fortnight.

Having observed infantile scurvy in 1 of 2 twins fed in the same way and on identical foods, Wallgren (Acta Ped., May 31, 1923) concluded that deficiency of vitamin C could not be the only pathogenic factor and that dyspeptic malassimilation was a concomitant factor in the scorbutic twin.

# INFLUENZA. - SYMPTOMS. -

According to B. M. Randolph (Med. Jour. and Rec., Jan. 16, 1924), the epidemic of 1923 differed from that of 1918 in many respects. The latter started at a given focus and radiated along the routes of travel as by metastasis, whereas the 1923 outbreak commenced simultaneously in a number of widely separated localities; furthermore, the latter epidemic lacked the intensity of infective power of the pandemics of 1890 and 1918.

The most frequent mode of onset was what appeared to be a cold in the head, slight sore throat, or mild tracheal irritation, lasting 1 to several days. Then there developed an abrupt seizure with headache, a congested sensation in the paranasal structures, burning sensation in the eyes in some cases, generalized muscular pain, marked surface hyperesthesia, chilly sensations, loss of appetite, constipation, fever of 100-102° F., and a sense of dryness, tightness, pain or oppression along the tracheobronchial tract. Physical signs in the chest consisted of coarse intensified breathing in the paravertebral spaces at the level of the inferior angles of the scapulas, often extending upward over the upper lobes.

J. C. Regan (Arch. of Ped., Jan., 1924) had repeatedly observed influenzal erythemas during the 1918 pandemic and again during the winter of 1922-23. Many of these cases were mild and the mortality was low. Although these eruptions do not occupy a conspicuous place, their close resemblance to scarlatina at times, and the fact that few physicians seem to be acquainted with their appearance, give them a certain importance. Influenza erythema is of a far less regular type than that of scarlatina, and is characterized by its transiency, abrupt appearance and disappearance, and irregular distribution. It lasts usually 2 or 3 days, though it may last less than 24 hours. It is seldom as deep red as the rash of scarlet fever; the skin at the site of the eruption does not feel rough to the touch, nor elevated. Miliary vesicles occasionally occur. erythema is not distinctly punctiform, but frequently gives a suggestion of small macular spots. The eruption attains its most marked development on the trunk of the body, with a less marked involvement of the extremities. It disappears completely, without residual staining.

In the course of an influenza epidemic of not very severe type, Pantaleoni (Gior. di clin. med., June 30, 1923) observed 5 cases in which the chief clinical manifestations involved the skin. All these showed an identical initial syndrome-high temperature (39.5-40° C.), preceded by moderate chill, violent headache, painful eyeballs, sensation of burning in the throat, thirst, dry cough and a scarlatiniform eruption over the neck, upper portion of the thorax, arms and inner aspects of the thighs. Nothing could be elicited on objective examination of the other organs, except an occasional swollen cervical gland. There were general depression and diffuse muscle pains over the trunk and extremities.

> A case of acute ascending myelitis as a complication of influenza was observed by Pussep (Zeitsch. f. d. ges. Neurol. u. Psych., lxxxvii, 377, 1923) in a man aged 51 who had had paralysis of the lower extremities for 5 days following a febrile catarrhal condition. The paralysis advanced from below upward. Sensation was abolished up to the axillæ. Finally the upper extremities were involved, respiratory disturbances began, and the patient died with symptoms of heart weakness and respiratory paralysis, 3 days after admission. Autopsy disclosed a focus of influenza in the middle lobe of the right lung, myocarditis, and hyperemia of the pia, which seemed to be thickened in the lumbar region. There and in the middle 3d of the dorsal spine the cord was bright red, due to punctate extra

vasations of blood on the cross section. The microscopic findings indicated hemorrhagic myelitis.

Encephalitic features have also been noticeable in the more recent epidemics. Moncalvi (Med. Jour. and Rec., Aug. 6, 1924) observed, in Milan, neuro-encephalitic forms of the disease. Several cases resembled closely epidemic encephalitis. Such cases, he believes, clearly demonstrate the intimate relationship existing between influenza and epidemic encephalitis, which should be considered a form of influenzal encephalitis.

Dopter (Paris méd., July 12, 1924) recalls that physicians of the early part of the last century were struck by the coexistence, or more or less immediate succession, of epidemics of influenza and meningitis, from which it was concluded that a causal relationship existed between these 2 diseases. When the distinctive germs which produce meningitis were discovered, this conception was entirely discarded. It seems, however, that it contains a certain element of truth, as shown by the following: December 19, 1923, an epidemic of meningitis due to meningococcus B broke out in a certain regiment where an epidemic of influenza had also appeared a few days before. Two cases of meningitis developed on December 19, 2 on December 21 and 22, and a 5th on December 23. After an interval of 25 days, new cases appeared January 10 and 24, and a last one on March 16. It is remarkable that 5 cases should have appeared within 4 days at 1st, such a rapid development being unusual except when it is the forerunner of a very severe epidemic; but after the disappearance of influenza in the next few days the epidemic of meningitis assumed its ordinary slow and insidious character.

ETIOLOGY.—As noted by Wolbach and Frothingham (Arch. of Int. Med., Oct., 1923), the cause of influenza epidemics has not been es-

tablished. The influenza bacillus, they state, is but one of the secondary invading organisms, and it is the unknown virus which causes the epidemic, including the general febrile reaction, the toxic symptoms and involvement of the upper respiratory tract producing in the lungs in a certain percentage of cases pathognomonic lesions.

As is well known, Olitzky and Gates (Jour. of Exper. Med., Mar., 1923) isolated and cultivated from the nasopharyngeal secretions of 6 patients suffering from the early stages of epidemic influenza an organism which they found capable of reproducing characteristic symptoms in rabbits, including pulmonary lesions that rendered them susceptible to secondary invasion. Bacterium pneumosintes caused the development of specific antibodies in the serum of rabbits, and these same antibodies could be demonstrated in the serum of patients convalescent from influenza. These antibodies could be developed in rabbits by the subcutaneous injection of suspensions of killed B. pneumosintes, and rabbits so injected can be immune to subsequent infection with this organism, this protection lasting about 5 months. Finally, injection of human beings brought about the same evidence of immune bodies in the blood serum.

Pfeiffer (Deut. med. Woch., Jan. 2, 1924), in a review of recent researches, regards with considerable skepticism Olitzky and Gates's Bacterium preumosintes. Hottinger found in rabbits after intratracheal injection of sodium chloride solutions such changes as they report after injections of these cultures. He finds

that the germ he isolated in 1891 is the most probable cause.

TREATMENT.—Nothing new has been reported in this direction. The most important indication during the 1923 epidemic, according to Randolph (loc. cit.), was absolute confinement to bed from onset until there had been a continuous absence of fever for 48 hours. Calomel, Dover's powder and acetphenetidin were the main remedies. On the 2d day the writer invariably began the administration of moderate doses sodium citrate and kept this up throughout the febrile period in uncomplicated cases.

M. Solis-Cohen (Amer. Jour. of Clin. Med., Jan., 1924) terms "lingering influenza" cases which prove resistant to ordinary treatment, have an unduly protracted convalescence, or show persisting toxemia and focal infection. The symptoms are those of a toxemia or of a focal infection with many manifestations, and of an inflammation or irritation of some portion of the respiratory tract with a tendency to hemorrhage. In most cases, demonstrable disease of the upper respiratory tract is present and the patient gives a history of previous attacks of upper respiratory in-The bacteria present are those ordinarily found in infection of the upper respiratory tract. Removal of the focus of infection is essential. After this a vaccine is given containing all the organisms shown by the whole-blood test to be pathogenic to the patient, the smears for the test cultures being taken from all parts of the upper respiratory tract.

INSANITY.—ETIOLOGY AND PATHOLOGY.—The influence of

focal infection on the development of mental disease is still undecided. Its rôle was studied in 120 cases with manic-depressive insanity, dementia precox, psychoneurotic and psychopathic personality reactions by Kopeloff and G. H. Kirby (Amer. Jour. of Psych., Oct., 1923). The removal of focal infection in 58 cases did not result in a higher percentage of improvement or recoveries than in a comparable group of 62 cases in which foci of infection were not removed. In every case that recovered, the recovery had been forecast before treatment was started; no case recovered in which a poor prognosis had been given. In only 1 case did an unexpected improvement occur. While the authors deem it desirable to eliminate focal infection when adequately demonstrated in psychotic patients in the same way as one should attempt to alleviate any physical disorder, it has not been shown that focal infection is the etiologic factor in the functional psychoses.

J. Walker (Lancet, Nov. 22, 1924) observed 3 cases which confirmed the importance of toxemia in producing mental disorders. Although the results of treatment in each case showed that the symptoms were due to disordered action of the bowel, when these cases came under observation the symptoms were more than suggestive of organic disease. One was a case of hypochondriasis; the 2d, one of toxic psychosis simulating clinically general paralysis, and the 3d, one of functional mental disorder resembling a case of organic nervous disease, in which alimentary toxemia was an important factor. The writer believes that toxemia of intestinal origin is more frequent than is generally believed.

Using the ureosecretory coefficient phenolsulphonephthalein the and tests in patients suffering from mental diseases; Targowla and Badonnel (Presse méd., Sept. 12, 1923) found that impaired function of the kidneys was frequent, especially in states of confusion, mania and melancholia. Diuretics were without effect, but the renal function became normal when the mental state im-In 22 cases of general paralysis, 19 had renal insufficiency.

A study of the hereditary and familial factors causing psychoses led Barrett (Arch. of Neurol, and Psych., Jan., 1925) to conclude that hereditary factors play a considerable rôle in the psychoses. In 3515 cases of psychoses the percentage of total hereditary factors was 77; in general paralysis it was 67.7; in epilepsy, 81.26, and in manic-depressive insanity, 84.13. The father transmits to the offspring in 39.3 and the mother in 60.7 per cent.

PROGNOSIS. — According to Breukink (Ned. Tijd. v. Gen., Mar. 1, 1924), when it is possible to hypnotize the patient, his affection is curable. He gives instances of degencrative psychoses which had long been mistaken for dementia precox, but which yielded to proper treatment. The injury from herding such cases with those of dementia precox is evident. Evidence is presented by D. Gregg (Arch. of Neurol. and Psych., Nov., 1924) that the prognosis of the psychoses of the later years is poor if hypertension complicates the situation, but good if it is absent.

TREATMENT.—According to G. J. Wright (Amer. Jour. of Psych.,

Apr., 1924), the majority of the neuroses and psychoneuroses seen are benign and cured with relative ease by means of reëducation and readjustment. Some of these cases are so complex, however, that considerable time and effort is required, and such patients should be referred to men specializing in this direction.

In children, Roubinovitch, Baruk and Bariéty (Presse méd., Mar. 29, 1924) state that treatment must be threefold: Specific, organotherapeutic and educational. Good results are obtained in syphilitic women during pregnancy, warding off congenital syphilis in the offspring. As to organotherapy, thyroid gland has proved most efficient, not only in endocrin disturbances but for arrested development in various ways. Many cases of secondary loss of balance and maladjustment are due merely to neglect in the puberty period.

Wagner-Jauregg (Wien, klin, Woch., Jan. 4, 1923) tried organotherapy in various disorders. Thyroid gland gave good results in every case of retarded development of children. In a combination of tumor of the pituitary with a goiter or symptoms of hypothyroidism, thyroid may improve the pituitary conditions and even the hemianopsia. It is well to remember in connection with hypofunction and hyperfunction of glands that qualitative changes (dysfunction) may be present. Thyroid and sex gland substances produced complete recovery only in girls in whom the psychosis began at puberty and sex development had been arrested in the infantile stage. Good results were also obtained in nervous girls with

hypoplastic uterus and greatly delayed menstruation.

The use of phenobarbital (luminal) in the treatment of the excited phases of mental illness was tried by L. D. Hubbard (Med. Jour. and Rec., Oct. 15, 1924), in view of the excellent temporary results obtained from the drug in epilepsy. In 13 colored females suffering from excitement, doses of 11/2 to 41/2 grains (0.1 to 0.3 Gm.) were given daily. Five patients, including 3 with dementia precox, 1 paretic, and 1 with manicdepressive psychosis, showed no Of the remaining 6, 3 change. showed improvement in the character of the excitement, 2 a shortening of the excited period, and 1 both change and shortening. Three patients, usually destructive, pugnacious and unmanageable, became silly, mischievous and good natured. One changed from a state of activity lasting day and night and resulting in exhaustion to an intermittent activity which left her in a quiet state for a part of each day. In the 3 cases in which the excited period was shortened, the symptoms reappeared as soon as the drug was withdrawn.

In endogenous psychoses Weichbrodt (Deut. med. Woch., Jan. 30, 1925) had encouraging results in the excited stages by means of 2 intravenous injections of 10 c.c. (2½ drams) of a 20 per cent. sodium salicylate solution. Anxiety and climacteric psychoses gave the best results. Hallucinations disappeared for a time.

In 3 cases observed by W. A. Shaw (Cal. State Jour. of Med., Feb., 1924), marked mental symptoms, such as *melancholia*, *homicidal mania*, etc., were completely relieved by

tonsillectomy, the cases being evidently due to focal infection from diseased tonsils.

G. W. Mills and C. L. Vaux (Arch. of Neurol. and Psych., Apr., 1923) hold that, in general, paretic patients should not be treated with arsphenamin, at least not those admitted to state hospitals-even those designated as late cerebral syphilis. The time to treat neurosyphilis is during the first year or so after the primary infection. No reliance is placed on 1 negative Wassermann reaction in a case under treatment. In view of the numerous discrepancies and contradictions of serology, it is recommended that repeated examinations be made in all unclear cases, and especially examinations in more than 1 laboratory.

Odier (Revue méd. de la Suisse rom., Feb., 1924) holds that the indiscriminate use of psychanalysis does harm when applied outside of proper indications, even by specialists. He outlines the contraindications and indications as follows: Psychanalysis is not indicated in narcissistic neuroses, kleptomania, fantastic pseudologia, simple neurasthenia, anxiety neuroses, traumatic neuroses, hypochondria, any psychoneurotic case in a person over 50 or with low-grade mentality, or when the patient is antagonistic. versely, the indications are: Compulsion neuroses, obsessions, classic hysteria, phobias, social maladjustments, doubt neuroses, perversions, ejaculatio precox, dysmenorrhea, frigidity, vaginism, onanism, enuresis, somnambulism, night-frights, emotional character defects of children, esophagogastrointestinal neuroses, and alcohol addiction.

INSOMNIA.—Nothing new has been published concerning this disorder. The trend is to regard it as psychic primarily and physical secondarily. According to Eaton's experience (Cal. State Jour. of Med., Apr., 1923) in 1500 cases, it is essential to impress on the patient the true conception that sleep is nonessential—rest being the essential ingredient of a normal day. Once the patient has learned to rest he will inevitably sleep because sleep is an automatic habit which will always engraft itself on rest when conditions are propitious.

INTERMITTENT CLAUDI-CATION. -Idelson (Deut. Zeit. f. Nerv., Feb., 1924) studied a series of 358 cases in 118 Aryans and 240 Jews. There were only 16 women, of whom 4 were Aryan. Abuse of tobacco was found in 175 cases; 88 patients were only moderate smokers, and 24 did not smoke at all. Exposure to cold played a great rôle. Abuse of alcohol was found in 46 cases, gout in 29, diabetes in 20, and general arteriosclerosis in 39. The rarity of the combination with arteriosclerosis is in agreement with the classic opinion that a coincidence of this affection with intermittent claudication is exceptional. The appearance of claudication as a transmitted hereditary familial characteristic, anomalies of the vascular system, manifestations of a permanent neurovascular tendency to thrombosis, and angiopathic diathesis were shown in 24 cases of cardiac failure. Included in the complications were 21 cases of hemiplegia, characterized by striking benignity. There were also frequent conditions of depression, perhaps re-

lated to the condition of the cerebral circulation. In cases of gangrene in young patients the incidence of syphilis was conspicuous. In gangrene after the age of 50 syphilis plays no rôle. A relatively large number of cases of gangrene were observed in the 3d decade and again in the 5th, limited to the age period of 56-60 years. These variations must be correlated with the blood-pressure, which in young individuals is not forceful enough to drive the blood through the narrowed lumina of the arteries, but which in older persons seems to undergo a compensatory increase. Most of the gangrene cases showed strikingly low blood-pressure. The main causes lie in injuries affecting the tonic innervation of the media, such as excessive strain of the legs and thermic irritations on the basis of a preëxisting angiopathic diathesis. In addition to this is the abuse of tobacco, especially in the form of cigarettes.

Lian and Descoust (Presse méd., Oct. 22, 1924) obtained in 2 cases of intermittent claudication an immediate and lasting improvement from diathermy. In both cases the arterial pressure and amplitude of pulsations in the affected limb were less than on the well side, and these differences persisted after the treatment in spite of the improvement obtained. Complete failure occurred in 2 other cases, and only slight improvement in a 3d. Diathermy does not affect the large arteries, but the smaller vessels and capillaries, together with the tissues traversed by the current, thus causing a local elevation of temperature, while the blood circulating in the part treated carries also a certain quantity of heat to the

whole body. This produces a rise of local and general temperature, profuse perspiration at the end of the treatment, and vasodilatation in the part treated, with an increase of collateral circulation.

INTERTRIGO. —Simchen (Arch. f. Kind., Dec. 18, 1923) used hexamethylenamin in 30 infants suffering from intertrigo (gluteal erythema and eczemas), and obtained recovery in 3 or 4 days without local measures. The urine and feces of infants thus treated did not have an ammoniacal odor. This confirms Cook's view that the condition is due to an ammoniacal fermentation of the urine. The doses used were 0.1 to 0.2 Gm. ( $1\frac{1}{2}$  to 3 grains) 3 times a day in young infants and light cases, and up to 0.25 Gm. (4 grains) 4 times a day for older infants or when the lesions were pronounced.

INTESTINAL OBSTRUC-TION.—ETIOLOGY.—Gutierrez (Rev. de Cir., Apr., 1924), reviewing 15 cases of ileus from gall-stones, found the total operative mortality to have been 53 per cent. In 1 instance (Guillaume's), the gall-stone was felt by palpation through the vagina and rectum, and the operation disclosed it in a loop of small intestine in the pouch of Douglas. In another (Gutierrez's) case, the calculus was as large as a hen's egg, and of pure cholesterol. All of his 6 patients died within 24 hours, although intervention had been restricted to simple extraction of the calculus, which was always readily found.

R. C. Alexander (Edin. Med. Jour., Nov., 1924) observed a case in which a single *dried fig*, swallowed whole, led to symptoms of intestinal obstruction.

At operation the fig was found just above the ileocecal valve. In its passage down the alimentary tract it had absorbed fluid and swelled sufficiently to block the intestinal lumen.

A. G. Bryce (Lancet, Jan. 3, 1925) observed a case in which roasted chestnuts caused incomplete intestinal obstruction. The intestine below the site of impaction was collapsed. Inquiry showed that the patient had swallowed the roasted chestnuts whole. A curious fact was that they had been unaffected by the digestive ferments over a period of nearly 10 weeks.

A case of fatal stercoral ileus in an infant 12 days old was recorded by O. Voigt (Münch. med. Woch., May 30, 1924) from compound licorice powder, after a friend of the family had given him several teaspoonfuls.

J. Jung (Casop. lek. cesk., Jan. 24, 1925) states that postoperative ileus from *adhesions* constituted 2.29 per cent. among 4779 laparotomies made in Zahradnicky's hospital. Almost ½ of them followed appendectomy. The total mortality from this ileus was 25.2 per cent.

PATHOLOGY.—According to Pringle (Irish Jour. of Med. Sci., May, 1923), intestinal toxemia has a large share in causing death in acute septic peritonitis. Three factors are at work in acute peritonitis: (1) Shock; (2) septic absorption from the peritoneum, and (3) toxemia from the intestine, the involved part of which is generally in a condition of paresis, producing obstruction. If the shock and toxemia be combated, there is a possibility of prolonging the patient's life sufficiently to give the fighting powers of the peritoneum a chance of dealing with the infection. He gives morphine and saline-glucose infusions and does an enterostomy high up in the small intestine to permit free escape of the toxic contents.

Experiments made by Costain (Surg., Gyn. and Obst., Feb., 1924) to find the path of absorption of the toxin in intestinal obstruction and how the toxin is formed showed that in all the fatal cases there was extensive necrosis and denudation of the mucous membrane, thus pointing to an absorption of toxins formed When the from necrotic tissue. upper obstruction was just below the pancreatic ducts, there was rapid necrosis of tissue above the obstruction, and death; but when it occurred above the ducts, just beyond the pylorus, even though more area was obstructed, the digestive juices, especially the pancreatic, were neutralized lower down and necrosis and death were considerably delayed. He concludes that the absorption of toxins occurs through the lymphatics to the thoracic duct.

TREATMENT.-In a case of intestinal obstruction C. A. Morton (Bristol 'Medico-Chir. Jour., July, 1924) found a large gall-stone in a coil of small intestine, but did not remove it. The fecal character of the vomiting ceased in about 12 On the 3d day following celiotomy, as there had been no further action of the bowels and the abdominal distention persisted, he gave an intramuscular injection of pituitary extract, 1 c.c. (16 minims). Within 1/2 hour the patient passed 1/2 pint of feces and some flatus. This was followed by marked decrease of the abdominal distention and cessation of vomiting. She then had 4 spontaneous actions and passed more flatus. But even after this the abdominal distention again increased to a marked extent, and another injection of pituitary extract, 1.5 c.c. (24 minims), was given and was repeated every 6 hours; every injection was very quickly followed by a loose action. The patient had much griping pain, both with and without these injections. Four days later, after a small spontaneous loose action, she had much distress in the anal region and passed a gall-stone which measured 1¼ by ¾ inches. The abdominal distention subsided and progress was uninterrupted.

In dogs with obstruction of the duodenum, R. L. Haden and T. G. Orr (Jour. Amer. Med. Assoc., May 10, 1924) were able to keep the animals alive 27 and 28 days by daily saline hypodermoclysis, whereas control dogs receiving distilled water instead died in 3 or 4 days. Two human patients, 1 with pyloric and the other with small intestine obstruction, showed marked clinical improvement following administration of sodium chloride. The writers suggest that in acute obstruction 1 Gm. (15 grains) of salt per kilo. of body weight be given as the initial dose and the salt be then continued daily in sufficient quantity to maintain the NaCl content of the blood within normal limits. Elsewhere, these observers (Colo. Med., May, 1924) note that the salt seems to prevent the destruction of body protein, as shown by the failure of a rise in the nonprotein nitrogen of the blood. In 1 case the utilization of 90 Gm. (3 ounces) of salt in 36 hours with practically no loss in the urine and without a rise above normal in the blood strongly suggested that chlorides are needed by the body during the toxic process. A 3 per cent. solution given subcutaneously proved very satisfactory.

In postoperative paralytic ileus, A. Mayer (Münch. med. Woch., July 11, 1924) gives a slow intravenous infusion of 500 to 1000 c.c. (1 to 2 pints) of physiologic saline solution with 4 to 8 c.c. (1 to 2 drams) of pituitary extract. The infusion may be given by the drip technic. The bowels soon moved in 70 per cent. of his 52 cases.

C. W. Flynn (Tex. State Jour. of Med., Sept., 1924) studied 55 cases of acute intestinal obstruction, with 19 deaths, and 10 cases of obstruction due to carcinoma of the bowel, with 4 deaths. The records of the fatal cases showed that all these patients had been ill for several days, hence the delay in diagnosis and postponement of operation were to blame. Practically all had been purged, thus accounting for perforations, gangrene and peritonitis. Most of them had been given opiates, which masked the symptoms, gave false security and delayed surgical intervention. The physical condition of every patient was critical when he finally came to operation.

INTESTINAL STASIS.— ETIOLOGY .- According to Friedenwald (So. Med. Jour., Apr., 1924), the symptom-complex of chronic intestinal stasis and toxemia cannot be explained alone by a mere mechanical alteration of motility of the intestine. There are also to be considered bacterial invasion; disturbances of innervation of the bowel and of the endocrin system; production of pathologic lesions in the bowel; changes in the intestinal secretions, and food decomposition with formation of toxic products. Which factor plays the most important rôle is as yet unknown.

TREATMENT.—Arbuthnot Lane (Brit. Med. Jour., Jan. 26, 1924)

holds that in order to prevent chronic intestinal stasis, a complete revolution in diet and habits is needed. The diet should consist as much as possible of vegetable food consumed largely in a raw state to avoid damage to vitamins, the unassimilated part serving to increase the bulk of the intestinal contents and the stimulating action on the reflexes. The free use of liquid petrolatum is essential. As to the stasis per se, apart from medical measures, all operative measures on any portion of the gastrointestinal tract should begin by an examination of the last kink and the careful freeing of the bowel from its acquired attachment to the iliac This course has given the fossa. most satisfactory results.

The following measures may, according to A. C. Jordan (Lancet, Mar. 3, 1923), be prescribed with every prospect of success where the X-ray has excluded all conditions requiring surgical intervention: A Curtis belt for ptosis; liquid paraffin for colonic stasis; belladonna for spasm of the sphincters; colloidal kaolin, 1 dessertspoonful in 1/2 tumbler of hot water night and morning, to absorb the intestinal toxins, and a saline purgative to drive onward the contents of the lower ileum. The kaolin also soothes the mucous membrane, and with the paraffin, converts the feces into a homogeneous mass passes through easily. Autogenous vaccines are of considerable importance in many cases. Irritating and readily decomposable foods are to be avoided. The patient should avoid fatigue, retire early, and acquire the habit of having a soft (not liquid) movement after each meal.

INTESTINE.—GAS CYSTS.— After reviewing 81 cases of gas cysts of the intestine, Naeslund (Svenska Läk, Handl., Nov. 15, 1924) reports 3 cases. In the 1st, recurrence in 7 months followed resection of a portion of the small intestine, with improvement after a 2d operation. Gastro-enterostomy resulted in complete recovery in the 2d instance, and no recurrence followed excision in the 3d. He studied 9 cases in pigs, and regards pneumatosis in man and in pigs as identical. Microscopic examination revealed traces of inflammation in all instances. Cultivation of the cyst tissue from 6 pigs produced a gas-forming, rod-shaped bacterium, which the writer calls the pneumatosis bacterium, and which, he shows, was the probable cause of

In 2 cases of gas cysts observed by Reverdin (Rev. méd. de la Suisse rom., Sept., 1924) an **exploratory laparotomy** sufficed to cause disappearance of the cysts in 1 case. They subside spontaneously in most instances. Recurrence, however, is common. Pneumatosis was complicated with volvulus in 1 of his patients, the woman dying 6 hours after the laparotomy.

the gas cysts.

#### TUBERCULOSIS.—DIAGNOSIS.

—In a clinical study of 45 cases of tuberculous ulceration of the intestines, J. E. Pritchard (Can. Med. Assoc. Jour., Jan., 1924) found that in 39 pulmonary symptoms preceded the intestinal. In every case general symptoms, such as loss of energy or weight or increase of nervous irritability, were manifest before the local symptoms. Nervousness was an outstanding symptom in 5 cases and fairly marked in 19; 32 complained of anorexia, and this was the first symptom in 15; discomfort was

Intestine

complained of in 33, and was the first local symptom in 7. Definite pain was the most frequent symptom, being present in 42, but it was the first symptom in only 5; in advanced disease it was rarely absent. Flatulence was present in 26, nausea in 19, vomiting in 10, and constipation in 19. Diarrhea, next to pain, was the most frequent symptom, occurring in 40 cases. The physical signs in the abdomen were comparatively slight. In only one case was there even slight rigidity, and in only 2 cases were masses palpable. Tenderness was noted in 22 cases, most frequently in the right iliac fossa. Barium meals were given to 44 patients, and in 43 definite filling defects were found, while 1 was doubtful. Hypermotility was demonstrated in 8 cases. The stools were examined in 42 cases after a meat-free diet for 3 days, and tubercle bacilli were found in 20. Occult blood was found in 30 of 42 specimens of feces Intestinal tuberculosis examined. may be present without producing any evident symptoms, whereas 1 or 2 small ulcers may give rise to definite symptoms. A frequent early complaint is satiation with abdominal discomfort and nausea after meals. Constipation, if persistent and obstinate, especially if alternating with diarrhea, is significant. Pus and blood in the stools indicate ulceration, but both may be absent though definite ulceration be present. Free hemorrhage is uncommon. The test for soluble albumin has been found of little help. Definite pulmonary tuberculosis adds great weight to every definite symptom.

Of 127 patients found by Schwatt and Steinbach (Amer. Rev. of Tuberc.,

Sept., 1923) at autopsy to have ulceration of the intestines, only 49 presented symptoms referable to the intestinal tract. Diarrhea is not necessarily a symptom of advanced intestinal disease; it occurs with few and early lesions localized to a small area. But if severe, persistent and uncontrollable, it usually indicates intestinal ulceration. None of the symptoms have any value in regard to localization. In the majority of cases, disease of the small and large intestines must be assumed. Toxemia, amyloidosis and catarrhal conditions of the mucous membrane probably play an important rôle in the genesis of the symptoms. In most cases, a definite clinical diagnosis of intestinal ulceration is not possible. The authors were not able to confirm the claims advanced by Brown and Sampson on behalf of X-ray methods.

PATHOLOGY. —Among 199 consecutive autopsies in the tuberculosis division of the Montefiore Hospital studied by Schwatt and Steinbach (loc. cit.), ulceration of the intestines was found in 65.3 per cent. The figures of other investigators range from 56.6 to 92.6 per cent. Among 128 cases, the small intestine was involved in 30, the large intestine in 19, and both in 79. The earliest lesions, whether in the form of miliary or submiliary tubercles or minute ulcers, were found on the summits of the lymph follicles, and the earliest site of localization, in the great majority of cases, in the lower ileum and cecum. Completely healed intestinal ulcers were rarely found; scars suggesting healed ulcers with active lesions in the same or other portions of the tract were more frequent. A tendency to healing in advanced and widespread disease was quite common. In spite of the large number of advanced ulcers found in most

cases, perforation of the serosa was infrequent. On opening the abdomen, the position and extent of tuberculous ulcers were usually indicated by areas of peritonitis of the overlying serosa. In advanced stages, the latter is covered in patches by a fibrinopurulent exudate, which may become organized, with adhesions, and the peritonitis may become generalized.

TREATMENT.—Operative interference is regarded by Schwatt and Steinbach (loc. cit.) as unjustifiable. In some cases, calcium chloride was found to relieve diarrhea and pain, while the ultra-violet rays proved ineffective. They consider the prognosis as bad; usually the onset of intestinal ulceration in advanced phthisis ushers in the termination of the case within 3 to 6 months.

E. H. Roberts (Amer. Rev. of Tuberc., Apr., 1924) tried calcium chloride as an adjuvant to heliotherapy and dietetics in 70 cases of intestinal tuberculosis, with good results. Five c.c. (1¼ drams) of a 5 per cent. aqueous solution of recrystallized calcium chloride were injected intravenously once weekly, every 5th day, or twice weekly, as required by the effects observed.

R. L. Laney (*Ibid.*, July, 1924) tried the pneumoperitoneum treatment, and urges that it is such a simple and safe procedure that it should be used more frequently on account of the relief it affords. His case was in a white man, aged 30 years, whose illness had begun with hemoptysis in 1917; he had been to the sanatorium with advanced pulmonary tuberculosis in 1921. In 1923, he developed diarrhea to the extent of 3 to 5 loose movements daily, with considerable abdominal pain. As his condition was serious and he had lost hope, it was decided to give an

intraperitoneal injection of oxygen to relieve the abdominal distress and diarrhea.

For the first injection, about 300 c.c. of oxygen were used, and for the second about 1500 c.c., the injection being made on the left side of the abdomen at a point corresponding to McBurney's; the temperature ceased to rise as it had been doing daily and fell back from 101.6° to 99.6° F. (38.6° to 37.5° C.); the pain and diarrhea diminished and he was able to take food. On the 12th day he was feeling better than he had been for months, but as the fever was again rising he requested another injection. From this 2d treatment until he left the hospital, his intestinal condition, as far as subjective symptoms and bowel movements were concerned, was very nearly normal. A year after the 1st injection he was still living comfortably.

#### IODINE.-PHYSIOLOGIC ACTION.

—The action of iodine is often attributed to a decreased viscosity of the blood, the reduced friction of the blood supply causing general improvement. There is also increase in the surface tension. Ephraim (Klin. Woch., July 29, 1924) found an increased rate of sedimentation in 4 out of 5 patients who had been taking 0.5 Gm. (7½ grains) of potassium iodide 3 times a day for 14 days. He attributes this result to a change of surface tension of the erythrocytes.

ADMINISTRATION.—In a study of the elimination of iodine in the urine, Bonnamour and Delore (C. r. Soc. de biol., Dec. 27, 1924) found that a maximum saturation of the tissues with iodine and the most durable action from it were obtained with iodized oil administered intramuscularly.

THERAPEUTICS.—The administration of iodine in goiter and exophthalmic goiter having been advocated at the Mayo Clinic, Sajous and Sollmann (Jour. Amer. Med. Assoc., Nov. 8, 1924) warn against the dangers of such a practice. O. Roth (Schweiz. med. Woch., Aug. 14, 1924) reports a case in which a small amount of iodine produced severe symptoms of hyper-

thyroidism and death in a woman, aged 27, who probably had had goiter, although during each of 2 pregnancies a visible goiter had disappeared under iodine treat-

ment. The author concludes that iodine therapy is not justifiable for hyperthyroid goiter in spite of its occasional successful use, since it jeopardizes the life of the patient.

J

JAUNDICE.—EPIDEMIC.— Costa and Troisier (Ann. de méd., Sept., 1924) report observations during the war in 2 epidemics of jaundice in Senegalese soldiers, comprising 106 cases in all. The clinical features and morbid anatomy were the same as in sporadic catarrhal jaundice. The period of incubation was 7, 9, or 13 days, but usually 7 days. The disease appeared to have been transmitted from man to man by way of the digestive tract, and by healthy carriers. The cook of the battalion was the propagator of the infection, by contaminating the food, as in typhoid fever. The epidemics occurred in summer, and disappeared with the first cold days.

In 1300 cases of epidemic jaundice observed by M. Garnier and J. Reilly (Paris méd., Sept. 29, 1923), superimposed typhoid infection was present only in 4 instances. Different bacilli of the paratyphoid groups found in epidemics of jaundice are signs only of secondary infection. The cause of the disease is as yet unknown.

HEMOLYTIC.—The familial nature of hemolytic jaundice is well illustrated by the Röschmann family, the record of which was recently brought down to date by Hattesen (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., xxxvii, 293, 1924). The father and 6 members of his family had the disease, and splenectomy arrested it completely in all. The recent re-

examination of the family showed that 11 of the 26 members of 3 generations had presented the family Splenectomy in the mother did not prevent development of the hemolytic jaundice in a child born 9 years later. In another instance the child has been free from the condition to date although the splenectomy was done during the pregnancy. Hemolytic jaundice can be transmitted by either sex to either sex. The results of splenectomy clearly point to the spleen as the organ responsible for the hemolytic tendency and indirectly for the jaundice, owing to the removal of the greater part of the reticulo-endothelial apparatus the operation includes.

A remarkable case has been reported by F. H. Bartlett and M. Wollstein (Amer. Jour. Dis. of Childr., Sept., 1924), in which, when splenectomy was performed, 2 supernumerary spleens were found. One of these organs, 6 by 3 cm. in size, was left in situ. The jaundice promptly disappeared, viz., in 3 days. The blood examination made 51 days after the operation showed, however, an increase in the white blood cells to 42,000. The polymorphonuclear cells were only 6.5 per cent., and the lymphocytes, 84 per cent.

INFECTIOUS.—According to G. Blumer (Jour. Amer. Med. Assoc., Aug. 4, 1923), this form of jaundice may assume several types as regards distribution, vis., the family, institutional, city, country and state-wide types. In the family outbreak the

disease may be limited to a few members of a single family or involve 2 or 3 neighboring or related families. Considerable outbreaks may also occur in schools, colleges, and other institutions, and may be compared to family outbreaks, since the living conditions are those of a family on a large scale. In city outbreaks, only certain sections may be attacked, or the distribution of the disease may be widespread. country outbreaks not infrequently occur in sparsely settled districts more or less remote from the main routes of travel. In the author's experience, once a district is infected, the disease may be looked for annually.

Infectious jaundice is essentially a seasonal disease, an analysis of the records of 50 outbreaks indicating that 72 per cent. of them occur during the fall and winter seasons. The disease is essentially one of childhood and adolescence. The sexes appear equally susceptible. There is almost unanimous agreement that personal contact is the method by which the infection is usually transmitted, but the exciting agent has never been The occurrence of demonstrated. large outbreaks should make the diagnosis a simple matter, although in the Southern states the disease might possibly be confused with yellow fever. In areas where dengue occurs it might also be thought of, as the muscle pains in infectious jaundice may be very severe. The complete absence of fatalities in most outbreaks is a striking feature of this disease.

In 26 cases carefully studied by C. M. Jones and G. R. Minot (Boston Med. and Surg. Jour., Oct. 18, 1923),

the morbid process appeared to be separable into 2 rather distinct phases. Early in the disease there was usually an obstructive phase in which the duodenal contents contain little or no bile. The second phase was marked by an abnormally large output of bile pigment into the intestine. Rapid clinical improvement followed with decrease of elimination of bile pigments into the duodenum. Jaundice of the skin and sclera sometimes lasts months, but disappears days or weeks before the bile pigments reached their normal level in the blood and duodenal contents.

OBSTRUCTIVE. — The experimental studies of W. Bloom (Johns Hopk. Hosp. Bull., Sept., 1923) have shown the need of revising present conceptions concerning this disorder. The prevailing idea is that removal of the bile pigments occurs by way of the blood stream, whereas in mechanical jaundice it occurs entirely by way of the lymph stream.

TREATMENT.—Downes (Trans. So. Surg. Assoc.; Med. Jour. and Rec., Jan. 2, 1924) urges that all patients suffering from chronic obstructive jaundice be operated upon, this affording the only hope of relief. Internal drainage of the bile ducts is preferable to external drainage; it is also desirable, when possible, to anastomose around inoperable growths in the intestine to avoid the formation of an artificial anus. The slightly greater risk involved in anastomosing the gall-bladder over simple drainage is more than offset by the increased comfort of the patient plus the added advantage of retaining the biliary secretion. Besides, in the event of a cure by external drainage, a secondary operation is necessary to close the fistula. The writer found it easier to unite

the gall-bladder to the stomach than to the duodenum, and since the passage of bile through the stomach is harmless, he considers **cholecystogastrostomy** the operation of choice.

> Preoperative preparation in 34 cases of obstructive jaundice was resorted to by W. Walters (Minn. Med., Jan., 1923) and prevented death from hemorrhage in all, only 2 bleeding from their wounds. Eighty per cent. were judged risks 3 or 4 by the consulting surgeon. The coagulation time was estimated by Lee and White's method before administering calcium chloride intravenously each day and on the morning of the day of operation. If the coagulation time of the venous blood had not been lowered to less than 9 minutes, operation was postponed until such reduction was obtained. Although it was 9 minutes or less, in some of the patients with jaundice calcium chloride was given intravenously as a precaution against postoperative hemorrhage, 3 injections of 5 c.c. (80 minims) of a 10 per cent. solution being made.

JOINTS. —INJURIES. —TREAT-MENT.—In injuries of the small joints, fingers or toes, Kazda (Deut. Zeit. f. Chir., Aug., 1923) observed in 95 patients that when the suppurating joint was opened wide, it could be left to heal by granulation. When, however, the opening was small, an abscess developed in the capsule and total suppuration followed unless resection was done. If the ability to flex the joint has to be sacrificed, then resection hastens healing. The final result depends greatly on the intelligence and perseverance of the patient. Children give the best results not only as to healing but as regards subsequent function. Fragments of bone or cartilage must be removed. In 1 case, after primary healing, the 4th and 5th fingers have regained good function; the 3d finger is still stiff. In another case the injury of the joint had been from an indelible pencil, and serious disturbances followed in both soft parts and bones.

TUBERCULOSIS. - TREAT-MENT.—A. O'Reilly (Jour. Mo. State Med. Assoc., Feb., 1924) considers heliotherapy of great value in the treatment of joint tuberculosis. At home it can and should be used wherever the sun shines. Insolation is begun as soon as the weather permits in the early spring, and is continued daily until the cold days of fall, except in bad weather. segments of the body are successively exposed, the time being increased 3 minutes a day until the entire body, with the exception of the head, is receiving treatment. Then exposure is increased daily by 5 minutes until it last from 2 to 3 hours twice a day. Care should be taken that patients do not become blistered. The head should be protected by a shade and the eyes by colored glasses. Treatment should be given in early morning and late afternoon. Headache, rise of temperature and other symptoms indicate over-exposure.

According to S. Feldman (Med. Jour. and Rec., Feb. 20, 1924), the X-rays have no direct action upon the tubercle bacillus, but they do have a strong influence upon the body at large and on antibody formation. In tuberculosis all efforts must be exerted towards the possibility of increasing the fighting power of the system. The X-rays and the rays of the mercury quartz lamp make an ideal combination. The 2 great qualities of the latter are their powerful germicidal action and the great

tonic effect upon the entire system. The ultra-violet rays of the sun lamp occupy a position in the spectrum midway between visible light and the X-rays, the shortest ultra-violet rays overlapping the longest X-rays. It is also likely that they overlap in their biologic action.

A. Gregory (Zent. f. Chir., Jan. 12, 1924) recommends the Hotz method of treating surgical tuberculosis. In 1922, Grekow reported exceptionally good experience with the method. His blood examinations agreed with those reported by Hotz. He injected the iodine-iodoform into the buttocks or ischiorectal fossa (the latter being less painful). Over a period of 9 years, 1000 hospital patients and several thousand ambulatory patients with surgical tuberculosis were thus treated, and 70 per cent. were cured, 20 per cent. much improved, while 10 per cent, received little or no benefit. Ten weekly injections were usually required. The writer employed the method in 101 cases, 45 being still under treatment; of the remaining 56, 25 may be regarded as cured; 25 are much improved, and 6 have received little or no benefit. Treatment has extended over from 4 to 6 months. Fifteen intramuscular injections (1 every 7 to 10 days) were usually required to show results. He injects from 5 to 6 c.c. (1½ to 1½ drams) into the gluteal region. The formula is 9 parts of 10 per cent. iodoform-glycerin to 1 part of 10 per cent. tincture of iodine.

R. P. Schwartz (Jour. of Bone and Joint Surg., Jan., 1924) is opposed to rigid immobilization during the healing process, but deems it indicated in the presence of pain, swelling, and muscle spasm. As these symptoms subside, immobilization should be gradually discontinued and graduated active exercises instituted.

Periarterial sympathectomy was used by Gundermann (Zent. f. Chir., Mar. 1, 1924) in 6 cases of grave bone and joint tuberculosis. It caused complete recovery in 3 and nearly complete cure in all others, except 1 with complicating ulcerative pulmonary tuberculosis. The curative action is probably ascribable to the passive hyperemia, which lasts several months after the operation.

## K

KALA-AZAR (LEISHMANI-ASIS).—DIAGNOSIS.—S. Chandra Basu (Calcutta Med. Jour., Aug., 1924) describes an epidemic occurring simultaneously in several families of a village in Bengal, in which the onset simulated that of typhoid fever. It appears to have been a mixed epidemic of malaria and kala-azar, the latter preponderating. Death occurred in 100 patients in 2 to 15 days, probably from malaria. The

150 other patients, dying of cancrum oris and dysentery, were doubtless cases of kala-azar. Many of the past epidemics of fever in Bengal were not diagnosed correctly; that they were not epidemics of either pure malaria or pure kala-azar is probable.

M. Labbé (Bull. Soc. méd. des hôp. de Paris, Jan. 12, 1923) states that the 2 cases of kala-azar recently reported as acquired in France bring to 4 the total already known.

TREATMENT.—In a comparative analysis of 153 cases as regards the effects of treatment, Napier (Indian Med. Gaz., Oct., 1924) accepted as the only satisfactory evidence of cure the subsequent history of the patient. Some are definitely resistant treatment with the antimony tartrates. The maximum total dose of sodium or potassium antimony tartrate necessary to a cure in any but resistant cases is 4 Gm. (1 dram) per 100 pounds of body weight of the patient. The Anglo-Indian seems more resistant to treatment than the Indian or even the European. Previous irregular treatment seems to encourage resistance, whereas relapsed cases do not show this resistance. The disease appears to be equally amenable to treatment at all stages.

According to Nasso and Mallardi (Pediat., Jan. 15, 1923), a primary or secondary resistance of the parasites to the antimony tartrate used in treatment may be due to too small doses or to irregular intervals in treatment. Some patients cannot stand larger doses. In such cases the treatment has to be adapted to the conditions. For resistant parasites, the doses have to be large (5 to 7 cg.— $\frac{3}{4}$  to  $1\frac{1}{10}$  grains) and the pauses longer in order to insure the elimination of the drug. With secondary resistance combined with intolerance of the patient, the treatment must be stopped for several weeks and started again with smaller doses. In primary intolerance, small doses have to be used every 2 or 3 days. With these methods no child needs to die from kala-azar.

> F. P. Mackie and H. C. Patni (Indian Med. Gaz., July, 1923) conclude from a study of 50 cases that

the generally accepted "full course treatment"-200 c.c. (63/4 ounces) of a 1 per cent. solution of sodium antimony tartrate-is often ineffective in curing the disease. Each case must be treated on its own merits. The antimony should be continued until most of the criteria of cure are evident, viz., cessation of fever, increase in weight, reduction in size of the spleen, increase in the total leukocyte count (especially that of polynuclear cells), physical appearance of well-being, and loss of the characteristic epidermal signs. Even when these favorable signs are present the patient may be harboring living Leishmaniæ; the only real evidence of cure, therefore, is failure to develop the parasite from material obtained by spleen puncture.

H. E. Shortt and R. Taran Sen (Indian Jour. of Med. Res., Oct., 1923) add a series of 16 cases of kala-azar treated with urea stibamin to the 5 previously reported. The aqueous solution of the drug is administered intravenously on alternate days, beginning with 0.1 Gm. (11/2 grains) and increasing 0.05 Gm. (3/4 grain) at each subsequent injection until 0.25 Gm. (4 grains) is reached; as a rule, this dose is not exceeded. The effects of the drug were determined by splenic puncture, and 1 or 2 more doses of 0.25 Gm. were administered after microscopic examination of splenic pulp gave negative results. Practically all patients were kept under observation for some weeks after treatment was discontinued, and no relapses occurred within that time. None of the patients exhibited any intolerance to the drug.

KELOIDS.—Hazen (Amer. Jour. of Roentgenol., June, 1924), after using the X-ray treatment in 16 cases, concluded that the vast majority can be successfully treated by this

method. The main danger is that telangiectasia may develop. Small hard lesions and lesions on the face are difficult to handle. Large lesions should preferably be excised and irradiation begun immediately after this is done.

E. M. Daland (Surg., Gyn. and Obst., Jan., 1923) reports benefit in every case treated by radium. The first evidence of relief was the development of a slight anesthesia in the lesion; then a disappearance of the itching and pulling sensation. Finally, there was a softening of the scar. There was less variation from the normal color of the skin in the cases treated with absorption doses. In a few of the cases treated with ulcerating doses, telangiectasis followed, showing that excessive dosage is the cause of this complication.

KERATOMALACIA. — Gralka (Monats. f. Kind., June, 1923) observed softening of the cornea in 16 boy and 14 girl infants at the Breslau children's clinic. Many of the infants were breast fed in whole or in part. There was a lack of the fatsoluble accessory factor in the breast milk, the mother's food during the pregnancy and lactation having been almost exclusively carbohydrate. In 22 of the 30 cases one or more infections had preceded the keratomalacia. All died but 11; 4 of these were left with good vision in both eyes, and 4 in one eye; leukoma developed later in 3 of this group. Treatment was with breast milk, butter-flour mixture and codliver oil. In most of the cases with a favorable termination, an abrupt increase in weight followed the change to this diet.

According to Hamburger (Deut.

med. Woch., Oct. 12, 1923), it is possible that keratomalacia which develops in breast-fed children is due to the fact that mothers do not get enough fat or eggs in their food. Differentiation from gonococcal and other catarrhal lesions is difficult, and therefore codliver oil should be given in every affection of the eyes of a child.

KIDNEY .- TESTS .- Breed and Rendall (Ann. of Clin. Med., Sept., 1923) studied the functional power of the kidneys in 250 suspected cases of nephritis. None of the so-called renal function tests proved reliable. Satisfactory results were secured from the blood chemistry and the 2-hourly and day-and-night variations in specific gravity at the end of 3 days of high protein, salt and liquid intake. High values for uric acid and sugar in the blood under these conditions were suggestive of cholecystitis; 20 such cases being subjected to operation, all showed varying degrees of cholecystitis or cholelithiasis, while 40 other such cases gave clinical evidence of cholecystitis. The operated cases all showed a lowering of uric acid and sugar in the blood after operation.

According to W. T. Longcope (Boston Med. and Surg. Jour., Aug. 23, 1923), no one test, nor any combination of functional tests, is alone indicative of nephritis. In the acute and subacute forms, the phthalein test is of service only, along with the blood chemistry, to ascertain progress. In the chronic forms, the chloride and nitrogen and the phthalein tests, combined, are of value to establish an early diagnosis. In uremia, the blood chemistry is all-important to differentiate the uremia of nephritic origin from other forms of coma.

From the standpoint of surgery, W. Peters (Beitr. z. klin. Chir., cxxviii, 395, 1923) warns that we must not expect too much from functional tests, which he considers only as supplementary to the clinical findings. They reveal reduced functioning of the kidney, but throw no light on its nature. A diseased kidney may respond apparently normally to tests, while there may be transient disturbance, even com-

plete loss of kidney function, in hysteria, acute nephroses, or calculi in the kidney or ureter, due probably to ischemia of the kidney.

CYSTIC KIDNEY.—The origin of congenital renal cysts has been studied by Kampmeier (Surg., Gyn. and Obst., Feb., 1923). The results are of clinical interest in that they show the existence of a vestigial primary generation of uriniferous tubules, and their occasional cystic transformation. It is easily conceivable how not only a single renal cyst may be derived from them in a kidney otherwise normal, but also how by its further growth and pressure it might readily become the starting point of a progressive formation of cysts involving the entire neighboring portion of the kidney.

Payr (Zeit. f. urol. Chir., Mar. 29, 1923) brings a polycystic kidney to the surface to be treated by ignipuncture. With the galvanocautery he pierces each cyst, or makes a crucial incision with it in the cyst, or cuts out the presenting portion by running the cautery around it. He has used these measures in 5 of the 14 cases of congenital cystic kidney he has encountered. The patients were all women but 3. All were benefited, and all are in good condition except 1 patient who succumbed to the progress of a duodenal cancer.

HYDRONEPHROSIS.—F. Hinman and D. M. Morison (Jour. of Urol., May, 1924), having studied the normal vascularization of the kidney and its relationship to hydronephrosis, conclude that the correlation of vascular changes with the progressive tubular alterations in hydronephrosis is an essential feature of hydronephritic atrophy, circulatory

conditions constituting a considerable and important factor in the process.

Researches by Lee-Brown (Jour. of Urol., July, 1924) also indicated the primary importance of the vascular changes and demonstrated the secondary nature of the tubular changes in hydronephrosis. The dominant change found was an ischemia due to increased intrarenal tension causing an obstruction and subsequent atrophy of the glomerular tuft, all followed by a cessation of the efferent glomerular supply.

The possibility of infection of the blood by organisms from the bowel was indicated by an experimental study by V. C. David and E. C. McGill (Ann. of Surg., Oct., 1924). They found that closed hydronephroses in dogs could be infected through the blood stream up to 3 months after the onset of their development.

#### TUBERCULOSIS.—DIAGNOSIS.

-While Hryntschak (Wien. klin. Woch., Apr. 3, 1924) recommends the Lowenstein culture technic for the diagnosis of renal tuberculosis, A. Hübner (Deut. med. Woch., May 4, 1923) holds that the value of demonstrating bacilli in the urine is greatly overestimated. Thus, tubercle bacilli readily penetrate an inflamed kidney even though it be the seat of no infection. Of diagnostic value, however, are: A progressive tendency of the morbid process and infection of the bladder, which should be established cystoscopically. The points of predilection in this organ are the ostium, vertex and the mobile parts of the bladder, all of which are affected early.

Negro (Jour. d'urol., May, 1924) found that catheterization of the ureter and the phenolsulphonephtha-

lein test jointly show lesions of the parenchyma and are more useful in the diagnosis of renal tuberculosis than pyelography. P. Mathieu (Paris méd., July 19, 1924) observed 3 cases of renal tuberculosis in children, and states that polyuria with a light-colored and cloudy urine, lumbar pain, pollakiuria and cystalgia are indications for immediate examination of the urine for tubercle bacilli.

A. Freudenberg (Zeit. f. urol. Chir., Dec. 24, 1924) found that when there is a tuberculous lesion present in the kidney, the ureter on the same side is usually pathologic, while the bladder is secondarily, though slightly, distorted, and is unable to expand symmetrically. It is instructive to make 2 or 3 exposures on the same X-ray plate, with different degrees of distension.

R. Hottinger (Zeit. f. Urol., xviii, 533, 1924) observed cases in which a tuberculous process in the kidney underwent prolonged development with colic as only symptom. This is due probably to extension of the inflammation into the upper ureter. Confusion with nephrolithiasis is particularly apt to occur when the incrustations cast shadows.

TREATMENT.-Judd and Scholl (Ann. of Surg., May, 1924) give the results of surgical treatment in 874 cases of renal tuberculosis, complete data being obtained in 611 instances. As a rule, complete lumbar nephrectomy was performed. In a few instances, however, transperitoneal nephrectomy was resorted to, or the peritoneal cavity was opened while the kidney was being removed by the lumbar route. The authors urge that such contamination of the peritoneal cavity markedly increases the operative risk. Such is also the case when, in the presence of a perinephritic abscess, removal of the kidney and drainage of the abscess at the same time are performed. Two of 8 patients died following such procedures. None of 8 patients died when the 2-stage operation was performed. In 18 cases of bilateral infection one kidney was removed. Four patients died from anuria immediately after the operation, and 10 during the next 18 months. Altogether, 31.2 per cent. of the 611 patients are dead; 58.6 per cent. are completely cured on an average of 4 years after operation, and 10.1 per cent. are still having urinary trouble.

In 27 cases of tuberculosis of the kidney observed by Ekehorn (Hygiea, June 30, 1924) and requiring nephrectomy, the local lesions were so far advanced that it was impossible to estimate the functional capacity of the other kidney without an exploratory exposure. In 20 of the cases the 2d kidney was found normal, and the contemplated nephrectomy was carried out with smooth recovery. Of 15 nephrectomized patients traced to date, 6 are in good health, free from pain and albuminuria, after intervals up to 12 years. The writer does not open the exposed kidney, but palpates both it and the upper ureter, as this structure shows tuberculous changes early. He sutures the skin at once and performs the nephrectomy at the same sitting.

Favreau and Querrioux (Presse méd., Feb. 14, 1923) observed normal development of pregnancy in women who had been nephrectomized for renal tuberculosis. The prognosis is good for mother and child in unilateral cases.

KNEE.—N. Allison (Surg. Gyn. and Obst., Oct., 1924) asserts that a

large proportion of disabled knees may be restored to normal function by appropriate surgical measures. In certain disease processes, notably tuberculosis, the operation should have for its object the creation of ankylosis. In the acute infections of the knee, operations to clean the joint cavity, or to establish drainage, hold the only promise of conservation of knee-joint function. Functional use of the lower extremity may be well carried out with a stiff, strong, weight-bearing knee, but is inhibited

or lost if the knee be insecure, the source of pain, or only partially functioning.

In the treatment of traumatisms of the knee, Semb (Norsk Mag. f. Laeg., Nov., 1923) recommends, on the basis of 16 cases of traumatic suppurating processes in the knee treated by him, puncture and injection of phenol and camphor according to Payr's technic in all cases of seropurulent synovitis. In empyema, the Carrel-Dakin method seems to be preferable, with early exercise of the joint.

L

LABOR.—BETTER OBSTETRICS NEEDED.-Polak (L. I. Med. Jour., Nov., 1923) states that in New York City alone 1 mother in every 178 dies from obstetric causes, and 1 infant in every 13 is stillborn. The leading causes of this needless loss of life are: Lack of prenatal study and antepartum care; the tendency to hurry nature's processes by drugs or operative intervention; lack of asepsis; lack of judgment in determining the indications for interference; error in choice of method, and lack of proper follow-up care during the puerperium. Contributory causes are a lack of appreciation on the part of the practitioner of his responsibilities when he contracts to attend a woman in labor. Lack of consultation is a large factor; the practitioner overrates his ability to cope unaided with an emergency. Every woman should be under continuous medical supervision from the beginning of pregnancy, and be instructed in the hygiene, the danger signals, and in the physician's and her own responsibility for the successful completion of the natal process.

Labor must not be hurried. With rectal examination, morphine and time, nature will do the work better than the practitioner can do it by intervention. Experience based on 1733 cases of labor leads Chipman (Can. Med. Assoc. Jour., Aug., 1924) to conclude that labor is a physio-

logic process if the woman is but let alone. The ideal labor, the one safest for the mother and child, remains still the labor that is spontaneous. Hence, the routine abrogation of the 2d stage by version and extraction or by the use of so-called "prophylactic forceps"; the "vicarious labor" of the obstetrician, is a practice unsafe and to be condemned. In the 1733 cases, only 7 mothers died—a mortality rate of 0.4 per cent.

Anspach (Amer. Jour. of Obst. and Gyn., Nov., 1923) speaks in the same vein. He holds that routine induction, routine version and the routine use of the prophylactic forceps increase the danger of childbirth to both mother and child. Induction, forceps and version should not be employed unless they are definitely indicated. An unavoidable fetal mortality in labor of from 1.5 to 2 per cent. represents the proportion of infants which at term will be born dead irrespective of the methods employed, while the avoidable fetal mortality in conservative obstetrics is about 1 per cent. The woman in labor should have the attendance of a competent obstetrician throughout labor, no matter when it starts or how long it lasts.

ANESTHESIA.—W. C. Danforth (Wis. Med. Jour., Sept., 1924) points out that nitrous oxide-oxygen is the

one anesthetic agency which will relieve the pain of the 2d stage of labor without at the same time interfering with its progress. Chloroform should be eliminated from obstetric practice in view of its known toxicity and harmful effects on the viscera and because of clinical evidence which is in accord with the laboratory findings. Ether should be given if gas is not available, and may be used to supplement the effect of gas at the moment of delivery and for operations requiring considerable muscular relaxation of the mother.

The rectal ether-oil mixture was tried by Thaler and Hübel (Zent. f. Gyn., Mar. 3, 1923) in 100 labor cases, 90 Gm. of ether in 120 Gm. of olive oil being used. The results in 88 cases were excellent, absolute failure occurring in only 4 instances. In 80 cases, the contractions were either normal or very strong. Some being apparently improved. In 20 cases the labor appeared to be weakened; in these either quinine or pituitary extract was used as adjuvant. The average duration of labor in 73 primiparas was 203/4 hours, and in 27 multiparas, 101/4 hours. When sleep was profound, no straining occurred, thus prolonging the expulsive period. As to the infants, 84 were in normal condition, 14 were apneic for a short time, but breathed normally within 5 minutes; 2 were asphyctic, 1 of these being soon revived, while the other, a forceps delivery, died. The method should be used only in hospitals.

A method evolved in the New York Lying-In Hospital for the amelioration of labor pains by morphine-magnesium sulphate injections and colonic ether instillations is described by A. B. Davis (Surg.,

Gyn. and Obst., June, 1925). When labor begins the usual soapsuds enema is given. When the contractions are strong, coming every 3 to 5 minutes and lasting 30 to 45 seconds, and the patient complaining of the pain, the contents of a 2-c.c. ampule containing both 1/4 grain (0.015 Gm.) of morphine sulphate and 2 c.c. (32 minims) of 50 per cent. magnesium sulphate are injected deeply, intramuscularly, into the gluteal region through a needle 11/2 inches long. The patient is then kept quiet and cotton placed in her ears, but is watched, lest she fall out of bed during contractions while asleep. One-half hour after the 1st injection, another injection consisting only of 2 c.c. of magnesium sulphate solution is given. The colonic ether instillation is never given sooner than 50 minutes after the 1st injection, and is withheld until the effect of the 2 injections has almost worn off; strong 3 to 5 minute contractions must be present. If the morphine and magnesium sulphate have produced no sedative effect, the instillation is made 20 minutes after the 2d injection. The ether retention enema consists of: Quinine hydrobromide, 20 grains (1.3 Gm.); alcohol, 3 drams (12 c.c.); ether, 21/2 ounces (75 c.c.), and olive oil, up to 4 ounces (120 c.c.). It is given warm and slowly from a funnel, preceded and followed by 1 ounce of warm olive oil, in the interval between 3 to 5 contractions. The catheter is passed into the rectum 6 to 8 inches. To facilitate retention the patient is told to keep her mouth open during pains and draw up frequently with her sphincter. When the effect wears off, 2d and 3d instillations may be given, but never at less than a 21/2-hour interval, and always with only 10 grains (0.65 Gm.) of quinine instead of 20. Each instillation is at once followed by injection of 2 c.c. of magnesium sulphate solution.

Ninety per cent. of the patients secure some relief, and many a great deal. The method is used as easily in a home as in a hospital. No fetal asphyxia, stillbirths nor postpartum hemorrhage are produced. The only contraindications are colitis, true diabetes and auditory disturbances.

BREECH PRESENTATION.— Being compelled by such a presentation to hasten delivery, G. Salen Rev. franç. de gynéc. et d'obst., Feb. 10, 1924) resorted to bidigital traction on the groin of the fetus. As a result, a local ecchymosis and necrosis occurred, which, however, healed perfectly. He urges that this procedure be resorted to only when absolutely unavoidable.

**EXAMINATION**.—Theodor (Zent. f. Gyn., April 12, 1924) condemns the practice of using, for rectal examination, a rubber finger cot instead of a rubber glove. Investigation has shown that the uncovered fingers readily spread infection.

W. Fürst (Zeit. f. Geb. u. Gyn., Feb. 10, 1923) always examines the vaginal secretions for gonococci as soon as the woman enters the maternity ward. If the gonococcus is found, the rectum is not disturbed.

FORCEPS.—The Kjelland forceps, introduced 9 years ago, is still the object of controversies. While Hoffmann (Zent. f. Gyn., May 20, 1922) states that since he has been using these forceps he has found none other necessary, and that in certain cases he was able to accomplish results which would have been impossible with other forceps, and II. Saenger (Ibid., July 12, 1924) recognizes that in many cases deliveries by this forceps would have required Cesarean (Schweiz. section, Wyder med. Woch., Mar. 13, 1924) warns against discarding entirely the old models. Young practitioners with comparatively little experience would not be helped by it, as it requires specialist training. Saenger (loc. cit.) deems it dangerous for both mother and child to use the Kielland forceps when the fetal head is still high in a contracted pelvis. When, however, the head is in the pelvic outlet, it is easier to apply than the older instruments and spares both mother and child. While admitting its advantages over the axis-traction forceps, M. Henkel (Med. Klin., Jan. 20, 1924) holds that the Kjelland forceps is not suitable as a universal instrument for practitioners. It requires such knowledge of the mechanism of labor and of the narrow pelvis that its advantages would be offset by the possibilities of wrong use in general practice.

INDUCTION OF LABOR.—T. J. Ryan (Practitioner, June, 1925), on the basis of experience in over 1000 cases and his rule, when wise, to shorten labor "by every conceivable means" in normal vertex presentations, records those measures which he has found most successful where no obstruction to delivery was found to exist. He first gives castor oil, 1 ounce (30 c.c.), followed by a hot drink; 2 hours later, an enema of soap and water; 1 hour later, a cachet of quinine dihydrochloride, 5 grains (0.3 Gm.), to be repeated every 2 hours till 15 grains (1 Gm.) have been taken. If labor does not come on strongly, hot fomentations over the abdomen usually bring on strong labor pains. When the os is at least the size of a half crown, he gives a deep intramuscular injection of pituitary extract, 1 c.c. (16 minims). Full dilatation usually occurs speedily with an uneventful delivery. Ryan objects to giving pituitary extract in the early stages of labor because it causes the longitudinal fibers of the uterus to contract strongly; the circular muscles only dilating slowly, there occurs but slight dilatation of the os and temporary inertia. The quinine, by acting "as a more lasting tonic to the longitudinal fiber," prepares the way for the pituitary extract.

The action of pituitary extract was studied by Steinberg (Amer. Jour. of Obst. and Gyn., Jan., 1924) in 66 cases, comprising 23 primiparæ and 43 multiparæ. The time between its injection and its demonstrable effect on the uterus varied from 1½ to 5 minutes, the average being 4 minutes. While there were no fetal or maternal complications, if the birth did not occur within 30 or 40 minutes after giving the extract, the 3d stage was prolonged from 10 to 20 minutes. The pains were stronger, did not last as long as normal pains, and the intervals between them were shortened. When it is given in the 1st stage of labor, before complete dilatation of the cervix, cervical lacerations may result.

SHOCK.—This condition in obstetrics is similar to that following serious accidents, rupture of the uterus, abundant hemorrhage, etc. Grosse (Rev. franç. de gyn. et d'obst., Apr. 10, 1923) attributes obstetric shock to sudden decompression of the abdomen, to an inhibiting reflex starting in the uterus, to toxemia, or to cardiac collapse. Generally the prognosis is not unfavorable. Manual exploration of the vagina and uterus shows that there is no hemorrhage or placental retention, that the uterine wall is intact, and that there is no important laceration of the genital tract. The patient should be kept warm and placed with head low, except in cyanosis, when the head should be raised. In case of atony of the abdominal walls, a tight abdominal bandage should be applied

and heart and nerve stimulants administered. Oxygen facilitates the interchanges and hematosis, but blood transfusion may be indicated in desperate cases.

Audebert (*Ibid.*, Oct. 25, 1924) observed 2 cases of shock complicating tedious delivery, twice in one woman, at her 1st and 3d labors. The other woman had eclampsia at her first delivery and preceding her 2d, which was followed by shock. Both recovered. In both cases the delivery was slow and difficult, requiring active intervention.

### LYMPHOGRANULOMATO-SIS. See HODGKIN'S DISEASE.

LARYNX.—CANCER.—Pancoast (Amer. Jour. of Roentgenol., Sept., 1924), after many years' observation, concludes that X-ray treatment of laryngeal cancer is disappointing, and should be used only in inoperable cases, as a palliative, and even then with considerable care and with tracheotomy. He deems the surgical removal by means of the improved technic superior in operable cases to radiotherapy. The experience of Leyro Diaz (Néoplasmes, Dec., 1924) in over 100 cases confirms the superiority of surgical treatment, provided total laryngectomy is practiced, with removal of the perilaryngeal infiltrations, of the affected lymphatic glands, and of the pharyngeal tissues involved. All this can be performed with the patient under anesthesia of the cervical plexus. To facilitate speech after recovery, a phonation tube may be used.

PARALYSES.—According to Lermoyez and Ramadier (Presse méd., Jan. 3, 1923), bilateral paralysis of the dilators of the larynx is in the

majority of instances due to syphilis. The condition causes permanent inspiratory dyspnea which at any moment may cause death by suffocation, the vocal cords remaining in close apposition. The treatment should be prompt and active, beginning with mercury and following it with arsphenamin. Iodides should be avoided, lest they cause edema or cough and thus aggravate the danger. In cases showing a tendency to suffocation, tracheotomy will avoid all danger while giving time to the antiluetic methods to eliminate the underlying cause.

In recurrent laryngeal paralysis, Frazier (Trans. Sect. on Laryng., Otol. and Rhinol., Amer. Med. Assoc., June, 1924), in coöperation with Chevalier Jackson, has resorted to nerve anastomosis, the descending hypoglossal nerve being sutured to the recurrent laryngeal. Six patients were operated on, 2 of these on both sides. In 3 cases function is returning, while the others were operated on too recently to warrant a report.

TUBERCULOSIS.—Sir St. Clair Thomson (Lancet, Nov. 8, 1924) obtained 25 per cent. of complete repair of the laryngeal tuberculous process in 477 cases treated. He credits the sanatorium régime and the prompt use of local measures, laryngeal rest, insured by silence or whispering, and the galvanocautery, with these results. Of the 119 cases in which complete healing took place, 69 were still alive from 2 to 10 years afterward, while 50 had died owing to the virulence of their pulmonary disease, even though the larvnx had remained well and cicatrized.

According to J. B. Greene (Amer.

Rev. of Tuberc., Sept., 1924), laryngeal tuberculosis is always a complication of pulmonary tuberculosis, even though the latter may not be apparent to the patient. The galvanocautery is not used to destroy the entire tuberculous area, as in the case of malignant growths, but rather to cause a local reaction, bringing fresh blood to the part and producing Swollen and edematous fibrosis. arytenoids, ulcerations on the dorsal side of the epiglottis, and edematous conditions of the epiglottis are greatly benefited by a few punctures of the cautery point. Infiltrations on the vocal cords or ventricular bands respond well when lightly touched, care being taken not to injure the delicate musculature. In very early lesions, characterized by simple hyperemia and not causing pain, vocal rest is the only treatment; it may result in arrest or cure of the condition.

Strandberg (Lancet, Dec. 8, 1923) claims to have 53 per cent. of cures of tuberculosis of the larynx following treatment by Finsen light baths.

Bronfin and Markel (Amer. Rev. of Tuberc., Nov., 1923) used chaulmoogra oil in 50 cases of pulmonary tuberculosis (38 far advanced) with laryngeal tuberculosis of various degrees. Of these, 43 received local treatment with chaulmoogra oil and 7 with the ethyl esters of the oil, "chaulmestrol." The average length of treatment was slightly over 4 months, the average amount administered to each patient being 20 c.c. (5 drams) of the oil or 18 c.c. (41/2 drams) of the chaulmestrol. The length of clinical observation averaged 12 months in the 43, and 10 in the 7 cases. No difference in the action of the 2 drugs was noted. Neither the aggravation of local symptoms reported by Peers and Shipman nor the

improvement observed by Lukens and by Alloway and Lebenson was confirmed.

LEAD POISONING.—Aub, Minot, Fairhall and Reznikoff (Jour. Amer. Med. Assoc., Aug. 23, 1924), in a study of the absorption and excretion of lead in the organism, found that much of the lead introduced into the gastrointestinal tract is not absorbed, but is either eliminated directly or never passes beyond the liver. Absorption from the respiratory tract (of animals) has been shown to be very rapid and dangerous. Animal experiments and clinical observations indicate that plumbism is very rarely caused by deposits of lead in subcutaneous or muscular tissue. After lead is absorbed it is carried chiefly in the blood plasma and to a small extent in the red cells, as the tertiary phosphate, and is stored in the calcareous portion of the bones. However, it has been found that if large quantities of lead are being taken into the body from outside sources or are being liberated from the bones, lead is distributed generally throughout the body and the percentage in the bones is reduced. Under these conditions acute symptoms of poisoning occur. If absorption is slower, then lead migrates to the storehouse in the skeleton, where about 95 per cent, is held without harm during the chronic stages of plumbism.

LEPROSY. —The leprosy situation in the United States was revealed by a letter of inquiry addressed to every state health officer by F. L. Hoffmann (Jour. Amer. Med. Assoc., Nov. 22, 1924). The establishment of the Federal leprosarium in Carville, La., in 1921 was of distinct value, harboring as it has 297 cases from all parts of the country. Of this number, however, 39 escaped, 36 died and 12 were discharged, the balance being all "contented and lawabiding citizens." In various states, however, cases of leprosy still occur pending their removal to the Federal leprosarium, when an appropriation

of \$650,000 for additional space and equipment will have been employed: California, 20; Louisiana, 13; Arizona, 5; Minnesota, 4; Illinois, 4; Pennsylvania, 2; North Dakota, 2; and each of the following states 1: Colorado, New York, Maryland, Nevada, Montana, Arkansas, Alabama, Utah and New Jersey. Maine is doubtful owing to the presence of a small leper colony in New Brunswick, while in Texas "several" of 11 lepers are reported to have been sent to the leprosarium, leaving the question as to the presence of any lepers in the state open. On the whole, the situation, thanks to the creation by the Government of the leprosarium, where the patients receive the best of care and medical attention, has greatly improved in this country in recent years.

PATHOGENESIS.—According to E. Muir (Indian Jour. of Med. Res., July, 1923), the leprosy bacilli multiply in the lymph channels, where they acquire their pabula, and are set free in the lymph spaces by softening of the area in which they are imbedded. The infection spreads from the skin to the deeper tissues, the osseous and muscular lesions being due to cicatricial pressure upon the nerve trunks. The cutaneous and nerve lesions are thus linked pathologically. The same observer (Lancet, Feb. 9, 1924) considers leprosy a self healing disease, through progressive immunity. Hence the need, in its 1st stage, of insuring adequate resistance to prevent passage of the disease into the 3d stage when deformities are produced.

TREATMENT.—To enhance the resistance of the patients, in the Philippines, Embrey (Philip. Jour. of

Sci., Apr., 1923) employed a high calory diet, an adequate supply of fresh vegetables and fruits, and, to supplement the insufficient ration with a cheap available protein, he used mungo, Phascolus aureus Roxburgh, a bean which is abundant in the islands and contains about 22 per cent. of protein. The conclusion seems justified that this high calory diet, with an adequate supply of mineral matter, of vitamins and of that substance found in green vegetables which aids in the deposition of calcium, is beneficial to lepers and that their weight and general health are improved thereby.

The results of treatment at Culion Leper Colony in the Philippines, as given by H. W. Wade (Jour. Philip. Isl. Med. Assoc., Sept.-Oct., 1923), were as follows: By Sept. 30, 1923, 4067 patients had received antileprotic treatment; of these 55.9 per cent. were improved, in 36 per cent, the condition remained stationary, 6.4 per cent. were worse, and 1.7 per cent. had died. Cases classified as improved and stationary should be considered together, for without treatment the disease would have progressed in most instances. In 30 per cent, of the cases plain chaulmoogric ethyl esters were given, and in 65 per cent. these esters were administered with 2 per cent. iodine; the improvement was about the same for both. Of 44 cases treated with plain morrhuic ethyl esters, 34 per cent. showed improvement; 45 per cent. of 80 patients receiving the iodized drug improved. The improvement rate was higher in females than in males. Young people up to 20 seemed increasingly amenable to treatment as they approached maturity, but from 20 to 30 (height of sexual activity) the improvement fell off. The next decade was one of greater improvement for both sexes, but in the 5th decade, the women, disturbed by the menopause, showed a marked drop. Time and regularity of treatment are important factors. Improvement seemed to be affected by total dose, and not by size of dose as compared to tolerance of the individual. This points to the need of some preparation that can be given in larger doses with less reaction, being reactions distinctly injurious.

LEUKEMIA.—The treatment of the various forms of leukemia by irradiation has received considerable attention, the trend being towards the conclusion that symptomatic improvement is alone to be expected from its use. Aikins (Amer. Jour. of Roentgenol., Nov., 1923) states that radium is so efficient in splenic lcukemia that in no other fatal disease can it be said to be more efficient. A single treatment suffices in some instances to bring about marked improvement within 24 hours, with restoration of appetite and sleep. The spleen recedes, usually to the rib margin, and the blood count drops so rapidly that the applications have to be stopped temporarily. In lymphatic leukemia and the mixed leukemias, the scattered enlarged nodes render impracticable the application of the radium rays in sufficient dosage to obtain as active results as in splenic anemia. Even then the enlarged glands return to normal in come cases and the white cell count is greatly reduced.

Minot and Isaacs (Boston Med. and Surg. Jour., July 3, 1924) tried out irradiation in 80 cases of chronic

lymphatic leukemia and 57 cases of the acute form, radium or X-rays being used, while 30 untreated cases served as a control group. While the duration of the disease was not influenced in either form of the disease, the symptoms in the chronic form, and particularly in chronic myelogenous leukemia, were undoubtedly benefited. They obtained improvement in 47 per cent. of 61 cases, slight improvement in 30 per cent., and none in 23 per cent. In 10 per cent. the patient's efficiency was The benefit strikingly increased. procured bore a fairly direct relationship to the progress the disease had made.

LEUKORRHEA.—In 300 cases of leukorrhea examined by Woo (Nat. Med. Jour. of China, June, 1924), 41 per cent. were probably of gonorrheal origin; endocervicitis was a common cause in persistent leukorrhea. He found a 1 per cent. solution of brilliant green and crystal violet in physiological salt solutions with 25 per cent. of alcohol applied locally most serviceable. In virgins Bröse (Med. Klin., May 25, 1924) found endometritis as the cause of leukorrhea in 43 out of 47 cases.

R. Salomon (Klin. Woch., July 15, 1924) warns against the use of bactericidal agents, the physiologic defense of the vaginal secretion being thus interfered with. He found daily douches of a quart (1 liter) of a 0.5 per cent. solution of lactic acid so effective that it sometimes caused restoration of the normal secretion within 8 to 17 days. The underlying systematic cause must also be eliminated.

Landeker (Med. Klin., June 29, 1924) advocates brief applications of

an ethyl chloride spray to the cervix and vagina, repeated 6 to 8 times at 2 day intervals.

### LIVER.—FUNCTIONAL TESTS.—

Widal's hemoclastic test was compared with the phenoltetrachlorphthalein test of Rosenthal by A. Gonzalez and W. G. Karr (Arch. of Int. Med., Sept., 1924) as regards relative value in various groups of hepatic disorders, the actual biologic changes being subsequently determined by operation or autopsy in many instances. They concluded that the hemoclastic test measures directly the physiologic capacity of the hepatic cells, and that it is the more sensitive of the 2 tests. The dye test measures the capacity afforded by the patency of the biliary passages. A combination of the 2 tests was found often helpful in the diagnosis and prognosis of obscure liver disorders.

R. Ottenberg, S. Rosenfeld and L. Goldsmith (Ibid., Aug., 1924) found the tetrachlorphenolphthalein test a valuable index of hepatic function in 103 cases tested by them. It proved useful in 16 cases, chiefly of cirrhosis, carcinoma and cardiac decompensation. It rendered possible the exclusion of hepatic disease in 18 cases. Its greatest value will probably prove to be the early recognition of metastasis and cirrhosis. The simplicity of the test recommends it particularly. It failed in only 5 instances of lesions proved present at autopsy. Similar appreciation of the value of the test was recorded by W. W. Boardman and G. D. Schoonmaker (Amer. Jour. Med. Sci., Nov., 1924), who found that in normal cases the time between the initial and maximum appearance of the dye rarely exceeded 3 minutes, while in liver disturbance it was 14 minutes or over.

The Widal hemoclastic crisis test was found by Andreen-Svedberg (Hygiea, Feb. 28, 1923) to be accurate in 16 cases of positive liver disease and negative in 4 dubious cases.

ABSCESS.—According to Heyd, MacNeal and J. A. Killian (Amer. Jour. of Obst. and Gyn., Apr., 1924), chronic abdominal infection may cause types of hepatitis which render

the patient invalid even after successful surgical intervention. An infection once initiated within the abdomen, its course is chronic and the liver reacts in various ways, but always with some degree of degeneration.

TREATMENT.—Pappalardo (Rif. med., Nov. 3, 1924) obtained recovery of hepatitis with amebic liver abscess by means of emetine enemas. About 4 hours after a cleansing enema with pure water, he injected 0.03 to 0.05 Gm. (½ to ¾ grain) of emetine in 100 c.c. (3½ ounces) of a mucilaginous solution, with addition of 20 to 30 drops of tincture of opium.

Ciotola (Policlin., Dec. 17, 1923) also obtained recovery after emetine in amebic abscesses, but used a large dosage, injecting 0.03 Gm. (½ grain) subcutaneously 4 times daily for 3 or 4 days.

According to Neligan (Lancet, Dec. 29, 1923), aspiration is preferable in every way to open operation in most cases of liver abscess. Except in an occasional case, to open a liver abscess is as much to be avoided as to open a tuberculous abscess.

Manson-Bahr, G. C. Low, J. J. Pratt and A. L. Gregg (Lancet, May 12, 1923) report 15 cases without a death nor even supervention of any untoward symptoms after aspiration, combined with medicinal treatment. An ordinary Potain's aspirator was used, but the needle was not inserted beyond 33/4 inches. When pus was struck, complete evacuation of the abscess cavity was at once carried out. If the pus proved too thick for aspiration, Manson's trocar and cannula was inserted along the tract of the aspiration needle and free evacuation thereby obtained.

CANCER.—In a case of cirrhosis of 15 years' duration, R. H. Jaffé (Arch. of Int. Med., Mar., 1924) found at autopsy an extensive transformation into both sarcoma and carcinoma, which had clearly developed, as shown by histological study, from the cirrhotic areas. The carcinoma started from regenerated tissue, and was stimulated by the sarcomatous process.

LUMINAL (PHENOBAR-BITAL).—The effects of this agent were studied by Gmelin (Münch. med. Woch., July 13, 1923) in 188 cases of epilepsy, while the doses of bromides administered were simultaneously decreased. At first the daily dose was 0.05 Gm. (34 grain) of sodium-luminal or 0.45 Gm. (7 grains) of luminal. At the time of report he gave on an average 0.15 Gm. (21/4 grains) (without bromides) in tablet form, sodium-luminal in a 2 per cent. solution being used. Subcutaneous or intravenous administration was found to have no special advantage over oral use. He tried, however, giving an intralumbar injection of a sterile solution of sodium-luminal (2 c.c.-1/2 dram-of a 5 per cent. solution, i.e., 0.1 Gm.-11/2 grains-of sodium-luminal). There was no soporific action; the patient soon had headache and fever, which after 12 hours reached its high point (39.5° C.-103.1° F.) but 12 to 14 hours later disappeared. This experiment was repeated. Sometimes there were by-effects (irritation of the brain, slowing of the pulse, slight rigidity of the neck, dizziness on sitting up in bed), but these were always slight and transitory. For 3 years he has used lumbar puncture with good results in all forms of epilepsy attended with many attacks. The patients complained of slight fatigue, as after a mild illness, for about a week after, but were very thankful for the abolition of their attacks, which in some cases was permanent.

Poisoning.—A case of poisoning was observed by H. W. Nicolai (Klin. Woch., Oct. 8, 1923) in a male epileptic, 21 years old, who had been free from attacks for 8 weeks without the use of luminal. He was brought to the hospital unconscious 14

hours after taking 3 Gm. (45 grains) of luminal, with the symptoms of severe alcohol poisoning, such as pallor, slight cyanosis and relaxed muscular tone. The skin was cool and moist, and the reflexes markedly diminished. There were occasional athetotic movements, stertorous superficial respiration, pulse small and at times accelerated, and nystagmus. The pupils were moderately dilated and did not react to light. Gastric lavage was unsuccessful. The urine contained albumin. No luminal was demonstrable. The treatment consisted in the application of heat, caffeine and camphor. The patient awoke a few hours later in a state of confusion. Administration of food proved difficult due to absence of the swallowing reflex. A lethargic condition persisted for 3 days. Eight days later he had an epileptic attack, but recovery ensued.

LUNGS.—ABSCESS.—Chevalier Jackson (Trans. Amer. Acad. of Ophth. and Oto-Laryng., 1923), warning that bronchoscopy, for either diagnosis or treatment, should not be undertaken as an independent procedure, and without the cooperation of an internist or surgeon, gives his experience with this method in pulmonary abscess. Bronchoscopy is of great assistance in obscure cases and has often reversed clinical diagnoses, e.g., from tuberculous to non-tuberculous suppuration, or from abscess to bronchiectasis. Bronchoscopic removal of a pulmonary endothelioma was successfully resorted to once; bronchoscopic treatment of tuberculosis is limited to obstructed drainage by pus accumulation. In all nontuberculous, non-malignant, not hopeless cases of lung suppuration, peroral bronchoscopic drainage is deemed worthy of first consideration. Such a procedure in a case not of long standing has started the patient on the road to recovery. Bronchoscopic measures should be instituted as early as possible, concomitantly with other remedial procedures indicated. W. F. Moore and R. M. Lukens (Atlantic Med. Jour., Oct., 1924) recommend bronchoscopic treatment in suppurative conditions of the lungs. The exceptions are when recent profuse hemorrhage has occurred; a moribund patient; very extensive disease of the lung, involving ½ or more of the lung tissue; organic diseases of the heart and great vessels, and laryngeal tuberculosis.

Brulé and Hillemand (Bull. Soc. méd. des hôp. de Paris, Nov. 7, 1924) urge that when, in abscess of the lung, the nature of the lesion is obscure, emetine should be tried. Patients with a latent amebiasis may be cured, and a futile artificial pneumothorax or operation avoided.

On the basis of 100 cases of nontuberculous pulmonary abscess studied by W. Whittemore (Surg., Gyn. and Obst., Apr., 1924), in 66 of which there had been an operation on the upper respiratory tract under general anesthesia, he states that from 10 to 30 per cent. of the cases may be cured by expectant treatment. Artificial pneumothorax may cure a very small number of cases in which the lung and costal pleura are not adherent, and bronchoscopy may cure a very limited number if treatment is established early. Surgery offers an excellent chance for cure where other methods of treatment have failed or are unsuitable.

CANCER.—DIAGNOSIS.—Barron (Arch. of Surg., May, 1922) pleads for more care in the recognition of cancer of the lung and of its prevalence. Of 12 cases encountered in

1 year, but 2 had been recognized clinically. According to W. Neumann (Wien. klin. Woch., May 1, 1924), a carcinoma of the upper lobe, and in its apex, is recognized by a percussion dulness extending to the 3d rib and along the edge of the manubrium, while auscultation in the same area reveals amphoric râles, bronchial breathing, but reduced or absent vesicular breathing. These he deems pathognomonic signs of apical cancer. In W. W. MacLachlan's (Atlantic Med. Jour., July, 1923) 4 cases, severe, acute pain, especially marked at night, causing the patients to cry out, or a dull but more continuous aching, was present in all, and grew in severity. Dyspnea on slight exertion, with cough in 3 of the cases, and blood-streaked sputum were also prominent symptoms, but X-ray findings afforded no help.

Pulmonary metastases were studied by Craver (Amer. Jour. Med. Sci., June, 1924) in 216 cases of mammary cancer and 15 of osteogenic sarcoma. The earliest physical sign of metastasis to the pleura or lung from breast carcinoma is a patchy limitation of breath sounds, particularly during inspiration. This may or may not be accompanied by crackling râles or pleural friction rubs. It may be detected in some instances before the Roentgenologist is able to demonstrate any shadow distinctive of metastasis. The earliest demonstrable signs of chest metastases of ostcogenic sarcoma may not appear until some time after the X-ray has succeeded in showing the small, round, well defined and circumscribed nodules. The author urges that in cancer of the breast and bone sarcoma, careful physical examination of the chest be always made in addition to the X-ray examination in order to disclose metastases to the lungs and pleura as early as possible.

TREATMENT.-In a case reported by J. H. Schroeder (N. Y. Med. Jour., Nov. 21, 1923), prompt recovery followed the use of X-rays. The patient was given 2 carcinoma doses of deep X-rays, and 6 weeks after the first irradiation his condition showed marked improvement; he felt better, had gained in weight and the physical signs were less marked. Roentgenograms at this time showed marked regression of the tumor. An X-ray picture taken 4 months after the second irradiation showed that the neoplasm had disappeared and the paralysis of the diaphragm subsided. The area formerly involved by the new growth showed apparently a slight connective tissue proliferation.

In malignant pulmonary metastases, W. A. Evans and Leucutia (Amer. Jour. of Roentgenol., Jan., 1924) also advocate deep Roentgenray therapy when metastases cannot be demonstrated in the remainder of the body. The best results were obtained in the embryonal type of sarcoma (angiosarcoma), while the fibroblastic, adult types, especially when rich in paraplastic structures, were refractory. The nearer the sarcoma approaches the undifferentiated embryonal type, the better the chance of success.

EDEMA.—In 2 cases observed by Binns (Med. Jour. of Austral., Aug. 9, 1924), acute pulmonary edema occurred in patients suffering from acute nephritis. In 1 case there was no apparent cause for or warning of the attack, while in the second, the

Lupus

edema followed aspiration of the pleural cavity.

TREATMENT.—In 22 cases M. John (Deut. med. Woch., Apr. 4, 1924) tried intravenous calcium chloride injections. Prompt arrest of the rattling râles, sometimes after a single injection, followed, probably due to reduction of the permeability of the capillary walls in the lungs. Zimmer has observed untoward symptoms in 1 of his cases (cyanosis, failing pulse and transient arrest of the respiration), but the writer has had no by-effects in the nearly 5000 injections administered.

H. Zimmer (Deut. med. Woch., Jan. 4, 1924) reports arrest of pulmonary edema in a girl poisoned with *carbon monoxide* by intravenous injection of 5 c.c. (80 minims) of a 5 per cent. solution of calcium chloride.

GANGRENE.—G. Rosenthal (Paris méd., Dec. 8, 1923) states that in order to obtain the best therapeutic results, pulmonary gangrene should be divided into bacteriologic types: Those with various anaërobes, in which endobronchial treatment and autogenous vaccine give the best results; the thick perfringens type, in which the antigangrenous serum of Weinburg is to be preferred, and a 3d type, characterized by the presence of spindle-shaped bacilli and spirochetes similar to those found in Vincent's angina, which yields to arsphenamin. While the treatment should be based on suppression of the focus of infection, syphilis should always be borne in mind as a possible cause.

Albacht (Deut. med. Woch., May 30, 1924) obtained recovery by means of injections of neoarsphenamin, although the sputum contained no

fusiform bacilli nor spirochetes. E. Pick (Wien. klin. Woch., Jan. 22, 1925) found that giving, besides the arsphenamin (1 or more injections of 0.15 to 0.30 Gm.), 5 to 10 c.c. (1¼ to 2½ drams) of a 10 per cent. solution of calcium chloride saved a case, while another in which the latter salt was omitted ended fatally.

LUPUS .- The treatment of lupus vulgaris and other forms of tuberculosis with artificial light formed the basis of a report by Reyn (Jour. de radiol. et d'électr., Aug., 1924), director of the Finsen Light Institute of Copenhagen. Recalling the experiments and work of Finsen, he contends that the Voltaic arc-lamp may wholly replace sunlight, and that it is far superior to the mercury lamp. Spina ventosa, treated ineffectually for several years in a marine sanitarium, was cured with complete restoration of mobility by light exposures. In different forms of surgical tuberculosis, results are comparable with those obtained by heliotherapy in mountainous regions. Local applications of the light may be usefully combined with the general exposures.

The treatment of *lupus erythematosus* by inunction with bacterial toxins is advocated by Dyson (Brit. Med. Jour., Sept. 20, 1924), who found in a group of 35 cases that over 70 per cent. reacted to either human or bovine tuberculin, and others to streptococcal vaccine. The clinical type of the cases reacting to tuberculin differed from that of those which reacted to streptococcal vaccine. The tuberculin or vaccine was prepared in the form of an ointment and rubbed into the lesions. In posi-

tive cases the lesion, at about the 3d day, became erythematous and swollen; in some cases inflammation was so acute as to cause an actual

discharge of serum. The reaction was local, occurring only in those patches to which the ointment had been applied.

## M

# MAGNESIUM SULPHATE.—

H. W. Loper (Amer. Jour. Med. Sci., Mar., 1925) while recognizing that magnesium sulphate is a most potent and reliable remedy in many diseases, concludes, after a comprehensive study, that there is no essential difference in its therapeutic effect, in biliary drainage, whether it be given by mouth or by means of the duodenal tube. Chemical opinion, he states, is to the effect that no change occurs in the solution in its passage through the stomach except possibly in concentration.

The value of magnesium sulphate in conjunction with morphine for obstetrical analgesia is pointed out by T. W. Adams (Amer. Jour. of Obst. and Gyn., Sept., 1924), who reports trial of this procedure in 60 cases in the Univ. of Michigan Hospital. Two cubic centimeters (32 minims) of 25 per cent, magnesium sulphate solution hypodermically with 1/8 grain (0.008 Gm.) of morphine sulphate had been found to give greater relief than 1/4 grain (0.015 Gm.) of morphine given alone. Varying amounts of relief were afforded in 93.4 per cent. of the women receiving these drugs, and no unfavorable effects on labor nor on the condition of the mother or child could be discerned.

#### MALARIA.—DIAGNOSIS.—A.

Rosenburg (Deut. med. Woch., June 22, 1923) states that *latent malaria* may be roused or simulated by arsphenamin preparations. To such an extent is this the case that in Berlin, for instance, tropical malaria had seemed to be endemic until traced to the use of arsenates. Yet, fully 37 per cent. of the so-called malaria patients had never left Germany, thus emphasizing the similarity between

the effects of arsphenamin and malarial infection.

The value of the aldehyde reaction was studied by Lal (Indian Med. Gaz., Aug., 1923) in 50 cases in which the malarial parasite had been found. He concluded as follows:

(1) The aldehyde test, as used by Napier, is not positive in malaria. (2) There occurs, however, in some persons infected with malarial parasites, a definite opacity formation, but only to a slight degree. (3) No relation can be made out between the size of the spleen or of the liver and the temperature and the slight reaction that takes place in some of the cases.

According to Sadi de Buen (Arch. de cardiol. y hemat., June, 1924), the Bini method for the detection of the malarial parasite is the best of the more recent procedures. Three or four drops of blood, obtained with the same needle, are defibrinated by circular movement of the needle, and spread upon a slide so that a uniform disk about the size of a half-dollar is produced. The film is dried for some 2 hours in the air. Hemolysis and staining are accomplished with the Giemsa stain, of which 1 c.c. receives 1 drop distilled water, the staining period being 2 to 3 minutes. The stain is then poured from the film, and the latter treated for 6 to 8 minutes with Leishman solution, of which 1 c.c. similarly receives 1 drop of distilled water. After gentle washing the film is dried vertically in the air. The blood smear should contain no fibrin clots; the more uniform the smear, the more effective are hemolysis and staining. Confusion is avoided by using only a small quantity of the Giemsa stain. Completer hemolysis may be obtained by treating the film for 4 to 5 minutes with distilled water, and the film may be stained for 20 to 30 minutes with Tribondeau solution mixed with 2 drops of distilled water

per cubic centimeter. Dilutions may be varied according to the stains employed. The parasites, though somewhat pale, are clearly visible against the colorless background. Remains of red cells stain brilliant pink. This method requires much less time than other procedures. As compared with others, it revealed parasites not discovered by a 10 minute search in 1.5 per cent. of 316 blood examinations. Gametes of Laverania malaria were detected in 2 cases escaping discovery by other methods. Malaria campaigns should not be suspended during intervals between epidemics.

PROPHYLAXIS.—In a review of the recent progress of malaria prophylaxis, Muehlens (An. de la Fac. de Med., Lima, Dec., 1924) recalls that during the World War, the Bulgarian army being deprived of quinine in 1918, combating of mosquitoes was resorted to by all. There was less malaria than in the preceding year when quinine had been available. The mosquito net, if good, he regards as the best personal protection.

Molloy (Amer. Jour. of Trop. Med., Mar., 1924) described his personal experience with the use of fish, minnows in this particular instance, during an outbreak in Nicaragua in 1915 and during one of yellow fever in 1919. More than 50,000 containers were stocked in Nicaraguan towns, and upwards of 300,000 fish used. The yellow fever, which was waning, disappeared promptly as the result of this wholesale distribution of fish. In malaria control studies in the department of Rivas, fish were relied on exclusively to control anopheles breeding in natural streams and ditches dug for drainage purposes. With a reasonable amount of care in keeping ditches and laterals open, the degree of control secured was surprising. All the ponds were

dried and all pools either drained or filled. Fish would have proven satisfactory in the ponds, but as the latter dry up during the dry season, restocking would have become necessary at the beginning of every rainy season.

Boyd (Jour. Roy. Army Med. Corps, Sept., 1924) states that quinine prophylaxis failed signally to prove its value during the last war and must be ruled out as a routine measure to be solely depended on for armies in active service. He advocates mosquito nets and strict rules for their adequate use. these, however, he urges mutual cooperation to brush mosquitoes from hands and face. Officers and nurses must protect their ankles by thick hose or mosquito boots. Gauntlets and face nets should be worn by pickets and nurses and repellants should be applied at frequent intervals-2 hours. Each morning every man must search the dark places in connection with his bivouac for resting mosquitoes. In addition, 1 man per company should be permanently employed in going around these places trying to find mosquitoes that have been overlooked. cutting of scrub for 200 yards around camps which are to be occupied for any length of time and the treatment of collections of water in the vicinity should be undertaken by the sanitary squad.

TREATMENT.—Hajos (Orvosi hetil., Apr. 13, 1924) states that Ochsner's intermittent quinine treatment, possibly with the interpolation of neosalvarsan injections, has won wide acceptance for the treatment and prophylaxis of malaria. It prevents quinine habit and distributes the quinine doses so as to assure suf-

ficiency of quinine in the organism at every stage of development of the plasmodium. It is advisable to give the quinine in solution, or in powder form followed by a drink of very dilute hydrochloric acid. Ochsner 1st gives a purgative and then a liquid diet with rice and vegetables. Every 2 hours for 2 days, 0.15 Gm. (21/4 grains) of quinine is given, with 250 c.c. (½ pint) of hot tea, and every 3 hours for 5 days small doses of arsenic. On the 8th day a purgative is given, followed on the next 2 days by 0.15 Gm. of quinine and hot tea every 2 hours, and then a tonic for some weeks.

According to E. Rosamond (So. Med. Jour., Apr., 1923), the abuse of quinine in children is almost universal throughout the South. The giving of quinine in sugary syrups to infants and children with gastrointestinal diseases is deprecated, as it may aggravate the existing condition. The giving of overdoses of quinine may account for many nervous phenomena not otherwise explicable.

The intravenous use of quinine acid hydrobromide is recommended by Acton and Knowles (Indian Med. Gaz., Apr., 1924) for algid, comatose and cerebral malaria, or when the patient cannot tolerate cinchona febrifuge or quinine sulphate by the mouth. The dangers of intravenous injections of quinine have been greatly exagger-The dose usually given by them is from  $7\frac{1}{2}$  to 10 grains (0.5) to 0.65 Gm.) of quinine acid hydrobromide freshly dissolved in from 15 to 20 c.c. (33/4 to 5 drams) of sterile saline solution. In the majority of critical cases, 1 or 2 such intravenous doses of 71/2 grains each, given during the first 24 hours, will speedily bring the patient into a condition of comfort, with a normal or subnormal temperature. The injections should then be discontinued and the patient commence the full 31day oral course of quinine. Intravenous quinine medication is useless in the prevention of relapses.

W. Cordes (Arch. f. Schiffs u. Trop. Hyg., xxviii, No. 3, 1924) calls attention to the availability of cinchonine hydrochloride as an equivalent substitute for quinine in tertian malaria. By the mouth, not over 1.5 Gm. (23 grains) a day should be given, divided into 3 doses.

Where malaria proves refractory to quinine, Roubachkine (Presse méd., May 5, 1923) recalls the efficacy of iodine internally. It does not kill the parasites but seems to ward off the febrile attacks and reactivate the quinine. He gives from 5 to 10 drops of a 10 per cent. tincture of iodine twice daily.

The use of Roentgentherapy having been advocated by various clinicians, the Italian Government appointed a commission to ascertain its value. Busi (Policlin., Jan. 8, 1923), its reporter, stated that the X-ray was not only contraindicated in acute malaria but that large doses could promote a severe attack by causing an extensive invasion of the blood by the parasite. Chronic enlargements of the spleen were found frequently to subside, however, under X-ray treatment. Some forms of malaria with infrequent attacks were also cured.

Nuñez (Amer. Jour. of Trop. Med., July, 1923), in 8000 cases, reduced the mortality to 0.2 per cent. in ordinary cases, and 6 per cent. in the malignant types, by means of arsphenamin. He also found that neoarsphenamin

in concentrated solutions, 0.9 Gm. to 2 c.c., acted as did higher dilutions, when given intravenously and by rectum. Nieuwenhuyse (Ned. Tid. v. Gen., June 18, 1921) had previously observed that in Northern Holland patients who could not take quinine found their symptoms subside after a single injection of neoarsphenamin, the parasites disappearing from the blood.

MALTA FEVER.—The term "Malta fever" suggests that the disease is in a measure restricted to the island of its origin and to the countries about the Mediterranean. This is an unfortunate error which causes its prevalence in various parts of the world, including the United States, to be overlooked. Cases have been observed in Paris and in cities of Spain, for instance, quite remote from the Mediterranean; the proximity of the latter, however, explains their occurrence. But, as stated by Tappan (Tex. State Jour. of Med., July, 1923), it is also encountered in our Southwestern States and Mexico. Endemic centers of the disease exist in goat-raising countries along the Rio Grande. It has been observed in Baltimore, according to Keefer (Johns Hopk. Hosp. Bull., Jan., 1924), and elsewhere. Its symptomatology should, therefore, be borne in mind, in case it should be met where so far it has not been recognized, for it may be confused with 5 commonly observed diseases, viz., tuberculosis, typhoid fever, malaria, rheumatic fever and influenza.

SYMPTOMS AND DIAGNOSIS.

—As described by Nattan-Larrier (Presse méd. hellenique, July 1, 1924), the prodromal symptoms—fatigue, anorexia, constipation, pain in

the limbs—are often overlooked or attributed to other causes owing to their mildness. As the disease progresses it may be confused with typhoid fever, but as a rule there is no epistaxis. liquid stools or dulling of the sensorium, nor early splenomegaly. Widal test is negative. Differentiation between Malta fever and malaria may be difficult, but the spleen in the initial stage of Malta fever is not swollen and the chills are much less severe. The fever does not reach 39 to 40° C. (102.2° to 104° F.) until after some days. The blood picture and the inadequacy of quinine therapy eliminate malaria. The arthralgia in Malta fever is very painful, often multiple and clinically similar to gonorrheal rheumatism. The chronic form may be mistaken for bone tuberculosis, as the symptoms are similar to those of tuberculosis: Fever, emaciation, sweating, and often suspicious lung symptoms. The incubation period is 6 days.

Bacteriologically, consideration should be given to (1) serodiagnosis, (2) blood cultures and (3) the cutaneous reaction (E. Burnet). The first is based on the capacity of the serum to agglutinate Bruce's microörganism (Micrococcus melitensis) in dilutions of 1:100 to 1:1000. Blood cultures, first carried out by Lemaire, serve to diagnose Malta fever on the 2d day. They can be used in the different forms caused by M. melitensis and M. paramelitensis: A sample of the blood is placed in serum (flask of 100 to 200 c.c. ordinary serum) at a temperature of 37° C. for 6 or 7 days; then ordinary agar or glycerin agar is inoculated, and on the 3d day, M. melitensis may be recognized. Six hours after vaccination a local edema develops in the skin, with change in its color and slight pain. At the site of the vaccination there develops a round or oval plaque which is red, pale or light gray, and 4 to 6 cm. in diameter.

PATHOGENESIS.—Malta fever develops mainly in persons who consume raw goat's milk. But, as stated by Burnet and Anderson (Arch. de l'Inst. Pasteur de Tunis, Apr., 1924), no tests are constantly positive in goats which carry the pathogenic organism of the disease. Moreover, the general health of such an animal may not appear affected, but an essential feature seems constant in them, viz., mammitis.

Goat's milk, as Tappan (loc. cit.) states, referring to the endemic prevalence of the disease along the Rio Grande, is consumed by infants and invalids, being often ordered by physicians. The disease can exist long without being recognized, being a septicemia with a chronic course. There is a possibility, moreover, that it be complicated with malaria. All dairies and goats furnishing milk should be carefully inspected by health departments. The organism may also gain entrance by insect bites or by contact (urine or dust); hence, routine serologic examination of all goat herds, whether furnishing milk to communities or being used for other purposes, should be considered.

P. Sée (Médecine, Dec., 1924) states that Malta fever can almost always be traced to cheese made from goat's milk or the raw milk, and is more prevalent than is generally suspected. Preventive vaccination of goats seems to be the most promising measure in prophylaxis.

Auricchio (Pediatr., Jan. 15, 1924) found a perfect correspondence of immunologic tests between the germ of Malta fever and Bacillus abortus. Children with Malta fever were treated with Bacillus abortus vaccines with as good results and even more active serologic reactions than when specific Malta fever vaccine had been employed.

TREATMENT.—Besides the usual supporting measures, autogenous vaccines are indicated. De Finio (Pediatr., Jan. 1, 1923) obtained recovery in 55 cases of Malta fever, mostly in children, a single injection of vaccine sufficing in many, others requiring 3 or 4 injections at 2 days' Intramuscular injections interval. proved as effective as the more difficult (in children) intravenous. De Partearroyo (Siglo méd., Jan. 19, 1924) states that while laboratory differentiation is indispensable, neoarsphenamin succeeds after failure of antiserums and vaccines, and may abort the infection.

MAMMARY GLAND.-CANCER.-INCIDENCE AND ETIOLOGY. - Mau (Nat. Med. Jour. of China, June, 1924), in a comparative analysis of 275 instances of tumors of the female breast in China, found that 225 were carcinoma and 4 sarcoma. A similar ratio prevails on our Continent. Watters (Boston Med. and Surg. Jour., Feb. 21, 1924), in an analysis of 1385 specimens of breast tumors, found but 4 sarcomas and 2 papillomas, 28 adenomas and 1 melanoblastoma. He now sees fewer cases of cancer of the breast each year than he did 20 years ago. But 5 cases of cancer of the male breast were found by Lay (Policlin., Jan. 21, 1924) in a total of 320 cases observed in the Venice public hospital.

In a series of 106 cases analyzed by A. R. Short (Bristol Med.-Chir. Jour., Apr., 1924), cancer was found far more common in women who had never suckled than in those who had; he therefore regards marriage, the bearing of children and suckling as a partial preventive. Kilgore (Cal. State Jour. of Med., Jan., 1923), out of a total of 1099 cancers of the breast, found but 49, or 4.45 per cent., which had arisen during lactation. Age is a prominent factor, 93 per cent. of all cancers having arisen after 30 years, while the number of cases per 100,000 pregnant or lactating women increased markedly after the age group 35 to 39 over the number among women not pregnant or lactating.

DIAGNOSIS.—W. H. Battle (Lancet, Jan. 5, 1924) states that a small swelling, especially after the age of . 30, is suspicious. An incision into or through it should show, even in small malignant growths, a cartilaginous resistance to the knife, a hard edge, a cupping of the surface, with the appearance of an unripe pear. The fundamental sign, according to De Quervain, is the degree of mobility of the tumor in relation to the rest of the breast tissue. According to C. Rowntree (Brit. Med. Jour., May 5, 1923), the earliest symptom of diagnostic importance is adhesions between the growth and the skin overlying it-not the infiltration met with in advanced cases, but a delicate involvement, causing a faint dimpling of the skin. It is often so slight that it is only visible after careful examination in suitable light.

In its earliest stages, this adhesive tendency can be made to appear by grasping the breast on each side of the suspicious nodule and trying to push the skin away from the tumor.

Steinthal (Münch. med. Woch., July 11, 1924) has also observed minute depressions in the skin, resembling those of an orange, over a cancer of the breast. The arm must be abducted to ascertain the movability of the tumor on the pectoralis major. The arm is then adducted and the hand introduced under the muscle to palpate glands on the edge of the pectoralis minor. The axilla as well as the edge of the sternum on the opposite side and the intercostal spaces may contain metastases in lymph glands. Enlarged glands, however, are not always cancerous. Paget's disease of the nipple is due to cancer and bleeding from the nipple is frequently an indication of its presence. Small abscesses with a hard wall are found sometimes in diabetic women.

TREATMENT.—Of all the curative measures proposed, radical removal remains the procedure of choice, where at all possible. To avoid metastasis, Czirer (Zent. f. Chir., Jan. 6, 1923) keeps as far away as possible from the strip of skin under which the superficial and deep lying lymph vessels pass from the mammary gland to the axilla, since it is along these particular lymph vessels that metastasis is likely to occur.

Among 70 cases operated by Sadler (Surg., Gyn. and Obst., Feb., 1923), the total number cured, based on a 5-year period, was 17. B. J. Lee and N. W. Cornell (Ann. of Surg., Sept., 1924) studied 75 cases which had been followed sufficiently long to furnish accurate data concerning the 5-year results obtained. The results were: Alive and with no evidence of recurrence, 10; died without recurrence more than 5 years after operation, 1; died with recurrence, 54; recurrence, but not completely traced, 10. Five women had previously suffered from breast abscess. Of 72 patients, exactly ½ had a history of previous lactation. The traumatizing agent varied from blows or falls on the breast to corset pressure, and 1 patient had been accustomed for years to stick pins into the part of the breast which subsequently developed cancer. The scirrhous type predominated.

Steward (Brit. Med. Jour., Jan. 24, 1925) observed a case in a woman aged 81, who had been operated on for cancer of the left breast when she was 50.

In the opinion of Pfahler (So. Med. Jour., Mar., 1924), in breast cancer the combination of surgery and X-rays will probably double the good results obtained by surgery alone. A. Beck (Arch. f. klin. Chir., Apr. 7, 1924) states that of 15 patients with inoperable mammary cancer treated by radiotherapy in the last 5 years, 4 are still living and in good health. These survivors were the older patients and the cancer had been of slower development. In his experience, the best results are obtained with 65 or 75 per cent. of the skin dose, at 4 or 6 weeks' intervals, repeated 6 or 8 times.

The general average of 9 German clinics, according to C. Linder (Deut. Zeit. f. Chir., May, 1924), is from 37 to 53 per cent. surviving for 3 years. In his personal cases (101), 77 per cent. of those given 1 or 2 intensive exposures have shown no signs of recurrence for 3 years to date. Only 17 per cent. have survived of those not irradiated, and 43 per cent. of those irradiated. None have survived of those given a course of mild irradiations. Medullary cancer seemed to respond most favorably to the postoperative exposures. This type represented 56 per cent. of the 3-year and 50 per cent. of the 4-year survivals.

'According to G. S. Willis (N. Y. Med. Jour., Apr. 18, 1923), radium used postoperatively and in recurrences has given results which justify its use; but he urges that the most successful

results will be obtained when radium is used as a routine measure, preoperatively. It disintegrates the tumor mass and cell nests and forms fibrous tissue masses which block off the lymphatics and prevent the dissemination of the tumor cells. He uses a transfixion needle, 15 cm. long, containing 33.33 mgm. of radium.

Aggressive radium therapy after surgery, Kelly and Fricke (Surg., Gyn. and Obst., Mar., 1924) hold, offers the best prognosis. Conversely, L. Simon and Wollner (Münch. med. Woch., Nov. 21, 1924) recommend small doses, far below the cancer dose, after radical operations on cancer of the breast, given at first every 6 weeks, later at longer intervals for a year or more. As stated by J. C. Lehmann (Zent. f. Chir., Feb. 16, 1924), the discussions at the surgical congress in 1920 and again in 1921 concerning the value of postoperative prophylactic irradiation of cancer of the breast introduced widely divergent views. But he now reports freedom from recurrence of 55 per cent. in 96 cases after 3 years, and 39 per cent. in 75 cases after 5 years, as compared with 32 per cent. and 28 per cent. in his cases in which postoperative irradiation was omitted. When intensive postoperative irradiation was employed he had 47 per cent. of recurrences the 1st year—as many as in the non-irradiated cases. Obviously, however, the whole question is still sub judice.

# MASTOIDITIS.—DIAGNOSIS.

—According to G. E. Pfahler (Ann. of Otol., Rhinol., and Laryng., Sept., 1924), no clinician should depend entirely on the X-ray evidence in mastoid disease, especially in decid-

ing upon operation, though in the series of cases reported, the X-rays failed to show disease only in 2 cases, 1 in a child 16 months old and another in a man 73 years old.

It is important that both mastoids always be studied, but it must also be remembered that Dixon found, in a study of 522 cases, asymmetrical mastoids in 14.5 per cent. and Auberg found 38 asymmetrical in the study of 120 pairs of mastoids. It is the variation in type-i.e., whether a mastoid is pneumatic, undeveloped, diploetic, or sclerotic—that makes interpretation difficult. A satisfactory Roentgenogram should show the external auditory meatus, the internal auditory meatus, the mastoid antrum, the temporomaxillary joint, and usually the outline of the lateral sinus, as well as the middle and posterior cranial fossæ.

MEASLES.—In various parts of the world measles has been attended by a high mortality. Thus, in Montevideo, according to Jaureguy (Rev. méd. del Uruguay, Sept., 1923), the general mortality from this disease in 1922 and 1923, instead of the usual 2 to 5 per cent., was 20 to 30 per cent., the temperature in some instances attaining 42.5° C. (108.5° F.). The necropsies revealed no specific lesions. A similar high mortality was observed in Calabria, Italy, according to Mantegna (Rif. med., Sept. 22, 1924). In Bogota, according to Ruiz (Rep. de Med. y Cir., Feb., 1924), measles shows a peak every 8th year, during which the proportion of deaths is unusually large. The next peak is due in 1930.

Berinsohn (Ned. Tijd. v. Gen., Oct. 11, 1924) found recurrent measles

recorded as having occurred in 5 per cent. of 80 infants, in 22 per cent. of 614 children 1 to 3 years old, and in 1.2 per cent. of 415 between 4 and .7 years of age. Beyond 7 years there was no recurrent case recorded. Interesting in this connection is that the mortality, according to Henry (Amer. Jour. of Publ. Health, xi, 302, 1921), is also highest in children under 3 years of age, 18 per cent. of the mortality having been during this period of life, while during a high mortality peak, 79½ per cent. of the deaths were likewise in children under 3 years. As the author states, our prophylactic results will depend very largely on how successfully we prevent measles in children under 3 years.

According to C. Herrman (N. Y. State Jour. of Med., Oct., 1923), infants under 2 months old whose mothers have had measles are immune, the immunity diminishing as they grow older. At 4 to 5 months, only 25 per cent. are infected. After this, however, the immunity gradually declines until at 9 months they are as susceptible as older children, whether breast fed or artificially fed.

PROPHYLAXIS.—The prophylactic use of convalescent serum, first used by Park and Zingher in 1916 in this country, and also in France in the same year by Nicolle and Conseil, has sustained its already demonstrated value. While Zingher (Jour. Amer. Med. Assoc., Apr. 12, 1924) states that whole blood or serum from convalescent subjects can be employed, Woody (Mo. Bull. Dept. of Publ. Health, Phila., Sept., 1924) used the serum only, obtained either from convalescent measles cases, recovered cases, or from healthy adults who had had measles at some

time. Unmistakable measles cases were preferred—where the opposition of parents could be overcome—the blood being collected 5 to 10 days after the temperature was normal. Among 122 subjects treated, only 6 developed measles; 3 of these ran a typical course ending in recovery, the remaining 3 developed a modified form which suggested a possible new clinical entity, but also with recovery. All of 96 cases had been definitely exposed to measles; only 4 of them developed measles after 22 to 28 days. The duration of the protection period is 40 days. Large doses of convalescent serum were tried in 2 developed and severe cases in which bronchopneumonia had developed; unmistakable improvement was manifest in 12 hours, 1 child being saved.

> A large number of reports speak in the same vein. Thus, out of 90 exposed children in whom convalescent serum was used by Prochazka (Zent. f. inn. Med., Jan. 17, 1925), but 5 developed the disease in a mild form. Among 80 children exposed closely to the disease, C. G. Sinclair and S. D. Avery (Milit. Surg., Dec., 1924) had but 8 mild cases. Dopter (Paris méd., June 2, 1923) urges that if prophylaxis by convalescent serum continues to justify the hopes now based on it, systematic arrangements should be made to collect the serum and distribute it where an epidemic is threatened.

Méry, Gastinel and Joannon (Bull. de l'Acad. de méd., Feb. 6, 1923) state that the preventive injection is effective if given before the 6th day of incubation; otherwise it tends only to diminish the severity of the infection. The dose for infants is 2 c.c.; 4 or 6 c.c. for older children. It should be larger in the later stages of incubation.

TREATMENT.—According to M. Loewenthal (Brit. Med. Jour., July 12, 1924), a specific curative action is

exerted by amidopyrin in measles. When this drug is given at the onset of the rash, there result a permanent reduction of temperature to normal or nearly normal within 12 hours; complete or partial inhibition of the rash; immediate euphoria, and disappearance of cough, coryza and conjunctivitis within a day or 2. No untoward effects from the drug were observed. The dosage is based on an adult dose of 12 grains (0.8 Gm.), the dose for children being derived from the formula: Age + 1, divided by 24. Three doses a day are given.

MENINGITIS.—CEREBRO-SPINAL.—DIAGNOSIS.—Lister, Pirie, Bloom and Girdwood (Med. Jour. of So. Africa, Aug., 1923), after a comprehensive study of this disease, urge the importance of early diagnosis. In their series, 70 per cent. occurred under the age of 10 years. The onset in older children and young adults was, as a rule, sudden, consisting in headache, chill, vomiting and fever, following general malaise. After 12 to 24 hours, stiffness of the neck and spine appeared, with tenderness at the angle of the jaw; Kernig's sign could be elicited in 95 per cent. of the cases. The head was retracted; the pupils reacted sluggishly to light; there were photophobia, hyperesthesia and great sensitiveness to noise. patients died in the first week. The death-rate in London for 1920 was 70 per cent. Convalescence was sometimes interrupted by exacerbations, frequently mistaken for relapses. In infancy, bulging of the fontanels was in some cases the only symptom of importance; this was not relieved by lumbar puncture, and was

therefore pathognomonic. On the other hand, gastrointestinal or respiratory symptoms were often the most marked. A frequent cause of failure of specific treatment was infection of the cerebral ventricles, causing hydrocephalus.

The chloride content of the cerebrospinal fluid and its diagnostic significance in meningitis was studied by H. Nowicka (Polska gaz. 1ek., July 27, 1924). It is a valuable aid in many cases of doubtful diagnosis, the more so as cytologic and bacteriologic examinations often fail to yield conclusive data. The decrease of chlorides is constant in meningitic processes. Only values less than 0.58 per cent. are undoubtedly characteristic of tuberculous meningitis. Values between 0.59 per cent. and 0.63 per cent. are found exceptionally in epidemic cerebrospinal meningitis. Values between 0.64 per cent. and 0.68 per cent are generally characteristic of suppurative and serous meningitis.

TREATMENT.—Intrathecal injection of antimeningococcus serum is now generally admitted to be the only efficacious treatment, and should not be delayed. Treatment may be (1) expectant—1 initial dose followed by watching, with repetition as symptoms may require; (2) daily intrathecal doses for 3 days, irrespective of improvement, then further doses according to need; (3) combined intravenous and intrathecal injections daily for 3 days, then as required. Girdwood (Med. Jour. of So. Africa, Aug., 1923) has had the most rapid recoveries where he has been able to introduce 50 c.c. intrathecally and 25 c.c. intravenously on at least 2 consecutive days. Between 30 and 60 c.c. of spinal fluid can generally be safely withdrawn. It is well always to introduce a little less

serum than the amount of fluid withdrawn; warmed to 100° F., it is allowed to gravitate into the spinal canal from a height of about 6 inches. The pulse is carefully watched and introduction stopped instantly if there are signs of collapse. After injection it is important to elevate the foot of the bed 18 inches for about 2 hours. In infants the writer usually adopts the expectant method, and gives a little bromide throughout the treatment. Infants do not bear injections well, being liable to suffer convulsions.

Basing his experience on 74 cases, S. Samet-Mandels (Arch. de méd. des enf., June, 1923) states that started early, and kept up long enough, with adequate doses, serotherapy arrests the disease and cures it. Daily hot baths relieve the pains and stiffness. The diagnosis is seldom clear in infants. When they become restless, with slight signs of dyspepsia, and the anterior fontanel is taut, lumbar puncture should be done at once. Tension of the fontanel is never misleading. The early diagnosis is even more important for infants than for older children, as from 90 to 100 per cent. die of those not given treatment.

L. Morquio (Arch. Latino-Amer. de Ped., xviii, 420, 1924) had a mortality of 16 per cent. in his 50 cases in children in the last 15 years. His results have been better since he has given 5 or 6 daily intraspinal injections of the serum, and then suspended it. If the fever keeps up, he resumes the injections, watching at this stage for symptoms of anaphylaxis. If the meningitis persists, repeated hot baths and an autogenous vaccine may prove useful. Treatment along these lines seems to ward off sequelæ.

INFLUENZAL. — Lisbonne and Leenhardt (Paris méd., Jan. 13, 1923) observed a fatal case of purulent meningitis due to Pfeiffer's bacilli, which were polymorphic.

In 5 cases seen by Greenthal and G. F. Kelly (Wis. Med. Jour., Sept., 1924), no typical clinical picture could be discovered, and examination of the spinal fluid alone gave the diagnosis through the gram-stained slide, the indol test, and the cultural characteristics of the bacilli. They believe that influenzal meningitis is usually primary and not secondary to a respiratory infection.

OTITIC.—Holger Mygind (Ugeskr. f. Laeg., Aug. 2, 1923) found nothing in 4 instances of otitic meningitis in 150 autopsies of meningitis subjects to explain the otitic symptoms during life. He practices craniotomy, particularly in the middle cranial fossa. If the dura shows no signs of a deep morbid process, he goes no further. Repeated lumbar puncture not only allows oversight of the course of the meningitis, but relieves the pressure, and is directly curative. He has also found an antistreptococcus serum useful. Recovery is the rule in otogenous meningitis when the primary focus is not too close and pleocytosis is slight or moderate. After removal of the primary focus, the meningitis subsides. But there is no arresting a fulminant meningitis.

B. Mendel (Klin. Woch., Apr. 23, 1923) noted that mild pressure applied on the dorsal wall of the external auditory meatus in meningitis caused severe pain and a marked reaction, even during stupor. The negative control is made by pressure on the anterior wall. He calls his sign the "auricularis phenomenon" and considers it an early symptom of meningitis.

TUBERCULOUS.—In a study of 66 cases in children, Kaneko (Jour. of Orient. Med., Nov., 1923) found fever the initial symptom in 51 cases; cough in 23; headache in 11; vomiting in 10; constipation in 9; stupor and anorexia in 8 each. The Pirquet reaction gave 100 per cent. positive at the beginning; in the 2d period 61 per cent., and in the last period, 20 per cent. The globulin test of the spinal fluid was positive in all. In most cases the albumin was increased, the highest being 0.23 per cent. and the lowest, 0.0165 per cent. The small lymphocytes were generally increased to a high degree. The polymorphonuclears came next, and the relation of the large lymphocytes was as 2:1:0.2. Tubercle bacilli were positive in 70 per cent. In the beginning of the disease they were mostly negative, but in the 2d and last stages they were positive.

E. Flatau (Rev. neurol., Aug., 1923) found that in boys with tuberculous meningitis, penile erections occurred when the patient's trunk was flexed forward until the head was brought near the knees, this flexion being repeated 3 to 5 times in succession. The erections sometimes occur after the 1st flexion. They persist for several seconds or more, and may be elicited repeatedly. They are present, not in early, but in developed, cases and during the period of general prostration, unconsciousness, etc.

MENOPAUSE.—In a study of the effects of the X-ray as inhibitor of the functions of the ovaries in 700 cases of artificial menopause, Béclère (Bull. de l'Acad. de Méd., Nov. 18, 1924) was led to conclude that the hot flushes were not due, as is generally believed, to a retention of toxins in the blood, but to a disturbance of the glandular apparatus. While the flushes are attributed to loss of the ovarian function, the nature of the morbid process is still The toxicity of the unexplained. serum before or on the 1st day of menstruation, suggesting the accumulation of poisons about this period, has, however, been demonstrated by the older experiments of Macht, which showed that blood serum obtained at this time inhibited the Similar results growth of plants. were recently obtained by Herz and Wachendorf (Deut. med. Woch., Sept. 5, 1924) with toxic serums from patients in the excited period of catatonia and jaundice, or after injections of killed proteus x 19 bacilli.

MENORRHAGIA AND ME-**TRORRHAGIA.**—The remedial use of irradiation in this disorder has received considerable encouragement. Nürnberger (Zent. f. Gyn., Jan. 6, 1923) tried the X-rays applied to the spleen in 13 cases of hemorrhage of ovarian origin and in 12 caused by tumors of adnexa. The bleeding ceased within 1 hour after the application in a few cases, and in the others in from 1 to 3 days. Sahler (Wien. klin. Woch., Apr. 17, 1924) tried the same measure in 143 cases, obtaining immediate results in 71 per cent. and delayed, though beneficial, results in 36 per cent.

According to Blacker (Lancet, Mar. 3, 1923), the recorded cases indicate that radium is an efficient means for the control of excessive hemorrhage of the menopause, small

fibroids and even excessive metrorrhagia. Varley (Brit. Med. Jour., Feb. 23, 1924) treated 9 cases of uterine hemorrhage. A tube containing 100 mgm. of radium bromide was used. The length of exposure depends on the amount of radium used, the thickness of the screening, the age of the patient, and the severity of the condition present. (Zent. f. Gyn., Sept. 13, 1924) states that in menorrhagia and metrorrhagia of non-cancerous origin, the radium should be applied in the uterus and not in the vagina, as the uterine walls are thicker, and consequently less exposed to injury. He uses a rather small dose in the hemorrhages of the menopause, to maintain, even though feebly, the menstruation. The results are better with radium than with the X-rays, especially in menorrhagia in his opinion.

J. Halban (Arch. f. Gyn., Apr. 16, 1923) resorted to splenectomy in a case of thrombopenic menorrhagia. The X-ray exposures of the spleen and other measures tried 2 years had had no effect, but in 3 days after the splenectomy the thrombocytes had increased to 133,000, and during the ensuing 6 months, menstruation has been normal and the girl in florid health. X-ray exposure of the ovaries has too many drawbacks for young girls, and it acts only on the genital sphere, not warding off hemorrhages elsewhere.

MERCURY.—POISONING.—A simple method for the treatment of mercuric chloride poisoning is recorded by A. E. Oliensis (Med. Jour. and Rec., Nov. 5, 1924). It resolves itself into the following indications: (1) To eliminate by mechanical means as much of the mercury as possible; (2) to prevent a severe acidosis; (3) to spare the kidney, and (4) to accomplish these results in the simplest possible

manner and with the least disturbance to the patient. The patient is put to bed, and 1 quart (liter) of milk and the whites of 3 to 4 eggs are introduced into the stomach. Gastric lavage is instituted. Twenty grains (1.3 Gm.) of potassium citrate and 30 grains (2 Gm.) of sodium bicarbonate are given 3 times a day. Six ounces (180 c.c.) of Fischer's solution (14 Gm.-31/2 dramssodium chloride and 20 Gm.-5 dramssodium carbonate in 1000 c.c.-1 quartwater) are given as a retention enema twice daily. The hot pack is employed daily. The diet is soft, salt is limited, and no meat or eggs are allowed. Eight ounces (240 c.c.) of milk are given every 3d hour. Water is allowed only in sufficient quantity to satisfy thirst. Magnesium sulphate is administered every morning in a dose sufficient to secure 2 stools daily. Of 14 patients observed since this treatment was instituted, only 1 died, and in this case there was such a severe gastroenteritis that the treatment could not be applied.

H. C. Semon (Brit. Med. Jour., Apr. 12, 1924) recommends intravenous injections of sterile solutions of chemically pure sodium thiosulphate. Three to 4 injections of 0.45 to 0.6 Gm. (7 to 10 grains), given intravenously in 5 c.c. (80 minims) of water on alternate days, proved sufficient in mild cases to clear up the fetor and salivation, and permitted early dental treatment to insure against recurrence. These injections were given with good results in 3 cases of mercurial stomatitis, 1 with an eruption. In a case reported by W. C. McBride, in which the patient had swallowed 71/2 grains (0.5 Gm.) of bichloride, administration of 15 Gm. (1/2 ounce) of thiosulphate by mouth and 0.45 Gm. (7 grains) intravenously checked the pain and diarrhea in a short time; the drug was repeated, and the patient made a complete recovery in a week. The author's experience with oral administration of the drug is confined to 1 case, in which it produced severe colic and diarrhea when given in dram doses twice daily.

MERCUROCHROME.—Oral Use.
—Given by the mouth, according to H. H. Young, W. W. Scott and J. H. Hill (Jour. of Urol., Sept., 1924), this agent causes little or no gastrointestinal disturbance un-

less taken in large doses a week or more. In a dosage of 900 mgm. (14 grains) daily, the urine shows colorimetrically a dilution of between 1:30,000 and 1:40,000 and occasionally 1:15,000 to 1:20,000, according to the intake of water. At this strength urine is bacteriostatic. The stools become deeply stained, almost brick red in color, and the normal bacterial content may be greatly reduced. A distinct germicidal effect in the urinary tract can be obtained by giving mercurochrome orally. It may also have value in infection of the stomach and intestinal tract and thus eliminate the cause of the urinary infection, colitis, etc.

Intravenous Use.—In a review of 255 cases of infection treated with intravenous injections of mercurochrome-220 soluble. including puerperal sepsis, septicemia, erysipelas, genito-urinary infections, gonorrhea, pneumonia, local infections, typhoid, meningitis, epidemic encephalitis, multiple arthritis, gas gangrene, acute osteomyelitis and psoriasis, Young (Surg., Gyn. and Obst., Jan., 1925) states that the percentage of recoveries was 42.3; marked improvement resulted in 38.8 per cent., and failure in 24 per cent. Over 3/3 of the failures occurred in cases of gonorrhea. The dosage in the cases detailed ranged from 1.7 to 7.5 mgm. per kilo. of body-weight, in a 1 per cent. solution.

The mercurochrome injection was in some cases repeated at intervals of 1 or more days after the 1st treatment.

F. S. Hopkins (Boston Med. and Surg. Jour., Oct. 16, 1924) states that the work done by Young and his associates in the use of antiseptics in the circulating blood may prove of great value. Definite cures were obtained in 2 cases of septicemia and 5 of deep-seated infections. The injections were used in 12 patients at the Springfield Hospital. Of the 12 cases there were 5 in which it was of temporary or doubtful benefit, and 2 in which it seemed to have a definite value. The reactions were not at all alarming except in 1 case where a rapid, irregular pulse occurred; this, however, responded promptly to digitalis. Intravenous mercurochrome should not replace any generally recognized indication for surgical treatment, but in many cases of infection not readily controlled by simple surgical procedures it is of sufficient value

to warrant continued trial. In septicemia it should always be used.

E. B. Piper (Amer. Jour. of Obst. and Gyn., Jan., 1925), having tried mercurochrome-220 soluble in cases of blood stream infection, concludes that the method is a step in the right direction. In spite of the reports of brilliant recoveries, it is undoubtedly a dangerous procedure and is warranted only by the severity of the condition.

Toxic Effects.-Toxic effects from mercurochrome have been observed in a few instances. C. C. Guy (Jour. Amer. Med. Assoc., June 28, 1924) reports the case of a 33-year old married woman, with a tuberculous hip of 15 years' duration, with discharging sinuses, in whom various solutions and pastes had given no results. The sinuses communicated, through the acetabulum, with an abscess cavity in the pelvis. After these sinuses had been irrigated with salt solution, 15 c.c. (1/2 ounce) of a 1 per cent. solution of mercurochrome-220 soluble were injected daily. Marked decrease in the amount of discharge followed, but 19 days after the 1st injection the patient complained of soreness in the gums, profuse salivation, loosening of the teeth, and diarrhea. The symptoms did not abate until 2 weeks after the injections were discontinued.

In a case observed by B. N. Wade (N. Y. State Jour. of Med., Nov., 1924), the stomatitis was followed by acute nephritis. The drug was injected 3 times weekly into an ovarian cyst cavity, 1 ounce (30 c.c.) of a 5 per cent. solution being used each time. After 3 weeks, soreness of the gums and moderate salivation appeared. Although the mercurochrome was at once discontinued, the stomatitis continued to grow worse. Her breath became extremely foul, the teeth loosened, and her mouth became very painful and tender. Nausea, diarrhea, edema of the face and ankles, with albumin and casts in the urine, followed. drainage from the cyst continued to be stained a deep red for more than 2 weeks after cessation of the use of mercurochrome.

Mercurochrome stains on the skin can be removed with a solution of chlorinated soda. Stained fabric may be cleared by dipping for 1 minute in 1 per cent. HCl

with 2 per cent. potassium permanganate, then in 1 per cent. HCl with 5 to 15 per cent. of U. S. P. hydrogen peroxide solution until the permanganate has been reduced, to be followed by thorough rinsing in water.

METAPHEN.—This is chemically bisacetoxymercuri-4-nitro-2-cresol: (CH<sub>3</sub>-COOHg)<sub>2</sub>: (C<sub>6</sub>H.CH<sub>3</sub>.OH.NO<sub>2</sub>). It contains 58 to 60 per cent. of mercury in organic combination. It is a germicide more powerful than mercuric chloride and certain organic mercury compounds when tested on cultures of Staphylococcus aureus and Bacillus typhosus. It is stated to be relatively nonirritating when applied to mucous membranes or the skin and to be without deleterious action on metallic instruments or rubber. Metaphen is claimed to be relatively non-toxic. White rats were found to tolerate 0.004 Gm. per kilo. intravenously and to tolerate (with but slight pain) 0.03 Gm. per kilo. intramuscularly.

Metaphen is recommended in the treatment of gonorrhea, ocular and nasal infections, for skin sterilization, and for the sterilization of instruments and rubber. Solutions of it in water are prepared with sodium hydroxide. For disinfection of instruments and for application to the skin, solutions of 1:5000 to 1:1000; for ophthalmological use, solutions of 1:15,000 to 1:10,000, and for urethral irrigation, solutions of 1:5000 to 1:10,000 are employed.

MIGRAINE.—J. A. Buchanan (Surg., Gyn. and Obst., May, 1924) has reviewed the history of 1335 cases, 75 per cent. of which had undergone 1 to 7 operations, of various kinds. Not a single patient operated on was cured or relieved more than temporarily, while those who had their reproductive organs removed, or a gastro-enterostomy performed, were made much worse.

According to A. H. Gordon (Internat. Clin., 1:120, Ser. 34, 1924), there is no known specific medicinal treatment, but he has obtained good results from Lauder Brunton's recipe

of 15 grains (1 Gm.) of sodium salicylate and 30 grains (2 Gm.) of potassium bromide, given at the very onset of the attack, and repeated if necessary. He is opposed to the use of morphine. A bed in a cool dark room and a cup of strong black coffee was the prescription of the late James Stewart.

A. Schlesinger (Schweiz. med. Woch., Jan. 25, 1923) uses pills of iron and calcium glycerophosphate and a laxative tea.

Bigland (Brit. Med. Jour., Dec. 15, 1923) has used calcium lactate with success. At the first sign of an attack, 30 grains (2 Gm.) of it must be taken immediately. It should be constantly carried by sufferers, and for this purpose the tablet form is essential. The tablets must be fresh. It does not cure migraine, but aborts the attack.

G. Stiefler (Deut. Zeit. f. Nerv., Jan., 1924) tried luminal systematically in 75 cases with a definite diagnosis (hereditary taint, hemicrania, nausea, vomiting, and disturbances of vision during the attack). Luminal decreases the irritability of the cerebral cortex, which is the ultimate cause, and also has a vasodilator action. In 5 cases there was a history of epilepsy in the family, while 12 patients had epileptic symp-When given in connection toms. with hygiene and dietetic measures indicated for epilepsy, luminal caused considerable improvement in 75 per cent. of cases. The attacks of migraine due to endocrin disturbances did not react to specific or organotherapy, except in 3 cases of spasmophilic diathesis in which intravenous injections of calcin caused decided improvement. Of the 58 miscellaneous cases 3/3 improved considerably on luminal. In migraine, the dosage may be lower than in epilepsy, beginning with 0.025 Gm. (3/8 grain) 2 to 3 times a day, which may be maintained or decreased if it has a good effect, or increased to 0.05 Gm. (3/4 grain) 2 to 3 times daily, but never to more than 0.1 Gm. (11/2) grains) twice a day. Attacks with long prodromal symptoms or typical periodicity may be aborted by luminal (0.05 to 0.08 Gm.-34 to 114 grains -2 to 3 days before the attack). The drug may also yield good results in symptomatic migraine, as in syphilis of the brain, progressive paralysis, and brain tumor.

In 2 cases of ophthalmic migraine seen by Delorme (Arch. d'opth., Jan., 1924), benzyl benzoate proved very effective. In 1 case 30 drops of the 20 per cent. alcoholic solution regularly aborted attacks when used early and checked them in 20 minutes where scintillating scotoma was already present. In the other case, 20 drops taken 4 times daily for months markedly reduced the frequency and severity of the attacks.

#### MORPHINE. - ACUTE POISON-

ING.—O. Moor (Deut. med. Woch., Oct. 24, 1924) urges the importance of subcutaneous injections of a 1 per cent. solution of potassium permanganate, or intravenous infusions of a 0.1 per cent. solution in physiologic sodium chloride solution. The permanganate combines with the proteins, and the morphine is rapidly oxidized.

MORPHINISM.—J. C. Doane (Therap. Gaz., Aug., 1924) regards drug addiction as a symptom. Drug users are of 2 kinds: Those of education and of more or less stable make-up mentally and morally, who, through ignorance, accident, or disease, have acquired an uncontrollable need for the continued use of opium or 1 of its derivatives, and a 2d group, the members of which display a conspicuous absence of any of these traits, except the need for the

drug. The former group, unfortunately, is in the great minority; probably 90 to 95 per cent. of the 4000 cases treated at the Philadelphia General Hospital in the last 8 or 10 years have been of the 2d type. Psychologic study of these patients disclosed not a few cases of retarded mental growth, and physical examination showed frequently recurring stigmata of degeneration; in 12 per cent. of 493 cases such signs were noted. Drug addiction, as a symptom of a serious defect of character or a lack of physical stamina, requires a readjustment of our views as to prognosis and treatment. This explains why most treated cases sooner or later relapse. Treatment relieves a symptom only, and the patient leaves the ward with the causal factors still persisting. The author does not believe that heroine or morphine has any inherent power quickly to decay character, but affirms that decay or deficient character is prone to lead to its use. The important question to be answered is the reason for its initial ingestion.

O. Wuth (Münch. med. Woch., July 4, 1924) saw very little good effect from bromides and narcotics, including chloral, in the treatment of morphine addicts. The antipyrin group is more advisable. Injection of cholin gave Klee and Grossmann promising results. R. von Hösslin (Münch. med. Woch., Nov. 7, 1924) regrets that in Germany laws make it impossible to treat morphine addicts against their will. Strict isolation with unpaid nurses (nuns), gradual withdrawal of morphine within from 3 to 10 days, and combating of abstention disturbances with large doses of phenobarbital gave fair results. Recurrences were frequent; he has never yet encountered a patient who was not able to procure for himself as much morphine as he wanted.

#### MULTIPLE SCLEROSIS.—

A case of retrobulbar neuritis in multiple sclerosis was observed by Rivet and Jany (Bull. Soc. méd. des hôp. de Paris, July 11, 1924). The impairment of vision disappeared under local treatment, but was followed 10 months later by typical symptoms of multiple sclerosis.

Retrobulbar neuritis may thus be the 1st symptom of this disease.

> E. Siemerling (Klin. Woch., Apr. 8, 1924), considering the infectious theory of the origin of multiple sclerosis, states that the mode of transmission is still much discussed. The tonsils particularly have been regarded as carriers, and atrophic rhinitis is also considered as a source of the disease. Behr emphasizes the connection between diseases of the optic nerve and the accessory sinuses, and points out that the optic nerve is very frequently affected in multiple sclerosis, its symptoms sometimes preceding all others by more than a decade. He believes in an immediate transmission of a virus by continuity through the posterior ethmoid cells.

TREATMENT.—Caution is urged by Siemerling (loc. cit.) in judging the results of any method used, as extensive spontaneous remissions have been abserved. Pregnancy makes the disease worse. Abortion as early as possible, followed by sterilization, is recommended in such cases. The conception of multiple sclerosis as an infectious disease which is probably attributable to spirochetes has, of course, brought arsphenamin into the foreground in treatment. Favorable results are reported with great frequency. The author has had good results from neoarsphenamin given intravenously in combination with calcium chloride or afenil (a specially prepared solution of this salt for intravenous injection). The injections are made twice a week, beginning with 0.075 Gm. given 3 times, then 0.15 Gm. 3 times, and 0.3 Gm. 9 times, a total of about 3 Gm. of neoarsphenamin. Every injection is preceded by an intravenous injection of calcium chloride (5 to 10 per cent.) or afenil (10 per cent.). With silver

arsphenamin the author has sometimes had very unpleasant exanthems, from which recovery was poor. Lumbar puncture is used only for diagnostic purposes. The earlier the treatment is begun the more favorable the results.

M. W. Scheltema (Ned. Tijd. v. Gen., May 31, 1924) holds that in multiple sclerosis silver arsphenamin should be resorted to as early as pos-Ocular disturbances, especially atrophy on the temporal side of the optic nerve, transitory paralyses, the Babinski sign, slight spasm in the legs and absence of the abdominal skin reflexes strongly suggest incipient multiple sclerosis. The drug should be used before the classical signs of it appear. In a woman of 23, multiple sclerosis producing nystagmus and paraplegia was greatly improved by a total dosage of 0.85 Gm. of the drug, given in 9 weekly intravenous injections. The initial injection was of 0.05 Gm., the others, of 0.1 Gm. each. Adjuvant treatment with the high frequency current, strychnine and potassium iodide was also employed. Improvement was material in a year, the symptoms after 18 months being slight stiffness of the legs, slight foot clonus on the right side, persistence on the right of the signs of Babinski, Oppenheim and Gordon, and slight vertigo. The Romberg sign was absent.

MUMPS.—Five cases of mumps, in 2 of which *orchitis* was promptly aborted and in 3 of which complications were prevented by the use of diphtheria antitoxin, have been reported by C. L. Thenebe (Boston Med. and Surg. Jour., Nov. 6, 1924).

In 7 other cases antitoxin was also successfully used as a preventive measure. While antitoxin apparently has some effect in preventing and arresting complications, it seemingly has little influence in causing subsidence at the primary seat of inflammation. Its action is possibly due to a non-specific protein reaction.

MYOCARDITIS. —DIAGNO-SIS.—According to E. P. Boas (Med. Jour. and Rec., Mar. 19, 1924), the diagnosis of myocarditis is warranted only in the presence of one of the infections known to affect the heart muscle, and when there are localizing signs such as cardiac dilatation or arhythmia. Tachycardia, breathlessness, precordial pain, weak heart sounds and low blood-pressure are of little diagnostic value in this connection, being frequently caused by the vasomotor disturbances which often follow acute infectious disease. The term chronic myocarditis should be used only to describe a chronic infection of the heart muscle, such as syphilis or, very rarely, tuberculosis or actinomycosis. Myocardial degeneration consequent upon arteriosclerosis of the coronary arteries, and myocardial insufficiency following hypertension or pulmonary emphysema, are not inflammatory processes and should be sharply differentiated because their clinical course is quite different. The scarred heart muscle of a patient with long standing rheumatic heart disease is not a chronic myocarditis, but is the endresult of previous attacks of acute or subacute myocarditis.

MYXEDEMA.—DIAGNOSIS.— Chaney (Jour. Amer. Med. Assoc., June 21, 1924) urges the importance of slowness of movement in all tendon reflexes as a diagnostic sign of this disease. Perfect parallelism was observed graphically in 4 cases, thus affording a clear-cut, easily evoked sign.

SUPPLEMENT.

The participation of endocrin organs other than the thyroid in the process is emphasized by T. Fahr (Klin. Woch., June 11, 1923), who cites 2 cases with autopsy findings of thyroid deficiency. In 1 of these, however, thyroid medication had proved ineffective, because the effect of the thyroid incompetency on the other endocrin glands was such as to prevent recovery. Examination of the other glands showed an adenoma in 1 parathyroid; numerous minute growths of the same character in the anterior pituitary, and a marked process of sclerosis in both adrenal cortices. These phenomena, he holds, show that a reparable thyroid insufficiency may come to give rise to an irreparable pluriglandular insufficiency. It follows that in such cases only early diagnosis, followed by efficient treatment with thyroid extract, can justify a favorable prognosis.

K. M. Bowman and G. P. Grabfield (Jour. Amer. Med. Assoc., July 21, 1923) observed a case in which the basal metabolism was minus 56 per cent. The condition of hypothyroidism had remained unrecognized for 12 years.

TREATMENT.—The case of a woman, 94 years old, who had first exhibited symptoms of myxedema at the age of 41, is reported by H. M. Raven (Brit. Med. Jour., Oct. 4, 1924). Having received no treatment for 20 years, she became bedridden and imbecile. After 5 weeks' treatment with thyroid tablets at the age of 61, her mental condition greatly improved and the condition of her skin generally was clearing up. After 15 months' treatment, she was practically normal and the growth of hair had returned. During the early years after her recovery she appeared mentally younger than a woman of her age, and it was suggested that the 20 years of myxedema had given her a long rest from which she benefited. The change in her physiognomy brought about by thyroid treatment was striking.

According to A. S. Jackson (Ill. Med. Jour., Dec., 1923), 50 mgm. (3/4) grain) of thyroxin, administered intravenously, is required to bring the basal metabolic rate of a myxedematous patient to within normal limits. A variable daily dose of from 0.8 to 2 mgm. ( $\frac{1}{80}$  to  $\frac{1}{32}$  grain) by mouth is required to maintain this level. Improvement following thyroxin is spectacular and almost The mentality, facial immediate. expression, voice, temperature, weight, skin, and appearance rapidly return to normal and edema disappears.

## N

NEPHRITIS, ACUTE.—SYMPTOMS AND DIAGNOSIS.—The value of renal efficiency tests in nephritis in children was studied by E.

Crawford (Glasgow Med. Jour., Feb., 1924). His conclusions were as follows: (1) At the onset of the disease they do not give any more de-

finite evidence of the severity of the case than do the clinical symptoms; (2) they do not give any indication as to the ultimate result; (3) during the course of the disease they merely corroborate the clinical symptoms; (4) they do not help in deciding if the case is cured, and (5) they are not of any help in differentiating between acute, subacute and chronic nephritis. [See also Kidney.]

A case of typhoid nephritis in a young woman was observed by Chalier and Desjacques (Paris méd., June 2, 1923). The paratyphoid B infection suggested ordinary typhoid fever until, during the 2d week, edema and tachycardia developed, with tubecasts. Complete recovery followed.

C. Lian and Haguenau (Arch. des mal. du cœur, Aug., 1924) recall that the large number of cases of acute nephritis observed during the World War permitted extended study of the cardiovascular complications of nephritis, which occurred relatively That the increase of bloodpressure was not very great was due to the youth of most patients. parallelism with the course of the nephritis, and its return to normal after cure of the nephritis showed that the blood-pressure was related to the acute nephritis, and not due to preëxisting hypertension resulting from chronic nephritis, arteriosclerosis or other kindred conditions. Cases observed during the war proceeded either to complete cure, to persistence of simple albuminuria without alteration of renal permeability or bloodpressure, or, very rarely, to the establishment of chronic nephritis with or without hypertension. In the hypertension accompanying acute nephritis, the systolic pressure exceeded the normal by only 20 to 40

mm. Hg, while the diastolic pressure exceeded it by not more than 10 to 20 mm. Hg. This rise generally declined as the cases improved. In rare cases it did not wholly disappear, and some patients finally developed permanent hypertension. Low bloodpressure very rarely accompanied acute nephritis, occurring only when icteric intoxication co-existed. The hypertension is probably an endocrine-sympathetic reaction produced either by toxins insufficiently eliminated, or constituting a defense reaction tending to increase renal secretion.

O'Hare and W. G. Walker (Atlantic Med. Jour., Feb., 1924) consider hemorrhagic nephritis a disease entity occurring during the course of an acute nephritis, and have seen 10 cases. The main diagnostic feature is the presence of a sediment consisting almost entirely of red blood cells with a rare hyaline or red-cell cast in the urine. The prognosis is usually good as to life, but most patients are left with some degree of nephritis. Treatment is not very satisfactory, but prolonged rest is most essential.

ETIOLOGY.—That nephritis may result from nasopharyngeal foci is suggested by Laemmer and Tarneaud (Presse méd., Jan. 23, 1924). Systematic examination of the urine in all persons (especially children) suffering from infections of the nose and throat is advocated in all such cases, with removal of adenoids and tonsillectomy if needed. Léon-Kindberg and Bloch (Bull. Soc. méd. des hôp. de Paris, Oct. 10, 1924), in a case of convulsions with albuminuria and hypertension in a young man, in whom a chronic infection of the tonsils and nasopharyngeal region was the apparent cause, saw complete recovery following tonsillectomy.

PATHOLOGY.—In a study of the bacteriology of the urine in nephritis in 29 cases, 20 of which were chronic and 9 acute, W. E. Cary (Jour. of Infect. Dis., June, 1924) obtained cultures of streptococci in 5 cases. In 10 cases, a feebly Gram-positive organism was found, and in 5, a spore-bearing organism. Other organisms found were Staphylococcus aureus, 6 times; an anaërobic S. aureus, twice; S. albus, once; B. coli, 3 times, and Diplococcus crassus, once. Only 2 specimens were sterile. Acute nephritis may be produced in rabbits by intravenous injection of suitable doses of several varieties of bacteria, and the chronic form may also be produced in rabbits by repeated injections of bacteria, but the changes in the kidney are never as striking as those seen in man.

**TREATMENT.**—According to V. Kollert (Wien. klin. Woch., Jan. 8, 1925), the milk diet generally prescribed in nephritis is unsuitable and possibly harmful, the quantity of milk required to maintain nutritive balance supplying an excess of fluid as well as of salt and protein. In acute nephritis with reduced urinary output and uremic symptoms, the diet should consist of carbohydrates and fats, such as sugar, sweet fruits and fruit juices, flour, rice and washed butter with little salt. When the uremic symptoms recede, the yolks of 1 or 2 eggs may be allowed, and later, vegetables cooked with little salt and some milk. Still later, boiled meat, 50 to 100 Gm. a day, is permissible. Where the condition is wholly or chiefly 1 of nephrosisfeatured by marked albuminuria and retention of water and salt, with milky blood serum and doubly refracting droplets in the urine,—stress is to be laid on a diet low in salt (only 2 Gm. a day) as well as in fluid.

In 12 cases of acute nephritis in children treated by R. S. Allison (Pract., Mar., 1925), absolute rest in bed was ordered until the urine had been albumin-free at least 4 days. For the 1st week a rigid milk diet was used, followed by gradual addition of eggs, cereals and fish. Salt was excluded throughout, and the protein reduced. A mixture containing tincture of hyoscyamus, 5 minims (0.3 c.c.), and potassium citrate, 5 grains (0.3 Gm.), was given 3 times a day during the acute stage, and later, iron in the form of the saccharated carbonate spread on bread and butter. Removal of the focus of infection, viz., tonsillectomy and adenoidectomy, was carried out at the conclusion of the acute stage, unless the urine failed to become albumin-free and relapses occurred, in which case the operation was performed without delay. All the cases recovered.

> In regard to the fluid intake in the nephritis of childhood, F. W. Schlutz (Minn. Med., Dec., 1924) deems it best, as a rule, not to insist on restriction. It is generally safe to give as much water as the kidneys can take care of. In acute hemorrhagic nephritis harm would be done by not giving fluid in large amounts. An output of urine approximating 3/3 of the water intake is satisfactory. As much as 48 ounces of fluid can be taken by most nephritic children without a resulting gain in weight or edema. In pronounced edema, restriction may be advantageous, but 10 or 12 ounces should be considered the minimum. Diuretics are of doubtful utility, with the exception of theobromine sodio-salicylate in the neph

rosis type of case. **Purging** and **sweating** are useful if not pushed to excess. In all cases with edema the **diet** should be **salt-free**.

A case of recovery from nephritis as a result of pneumonia has been reported by Giugni (Policlin., May 5, 1924). The patient was a young man with nephritis, edema and high blood-pressure. The function of the kidney improved materially with the onset of lobar pneumonia, which ended favorably by crisis. Within a few days all the signs of nephritis, including hypertension disappeared.

[See also ANURIA.]

## NEPHRITIS, CHRONIC.— SYMPTOMS AND DIAGNOSIS.—

In a comprehensive study of the toxic form of nephritis caused by organic obstruction and stasis in the duodenum, G. E. Brown, Eusterman, Hartman and Rowntree (Arch. of Int. Med., Sept., 1923) found the following definite clinical picture: (1) Vomiting of large amounts of a thin, serous, bile-stained fluid; (2) evidences of dehydration, a red florid complexion, high hemoglobin, low blood-pressure and asthenia; (3) tetany-like manifestations; (4) features of shock and uremia. The blood showed: (1) A low level of chlorides; (2) a high carbon dioxide carrying capacity, and (3) a high level of blood urea and creatinin. Urinalysis revealed albuminuria and casts. Renal functional studies indicated renal insufficiency, high values for urea and creatinin, and a decreased excretion of phenolsulphonephthalein. Necropsy in 6 cases showed the pathologic condiof nephrosis, characterized either by acute degenerative changes in the tubular epithelium or by a diffuse nephritis.

Laroche and Desmoulière (Presse

méd., Aug. 20, 1924) observed 14 cases of chronic nephritis with azotemia, but without hypertension, and with no hypertrophy of the heart. Nervous disturbances were frequent, as the nervous tissue was particularly sensitive to the uremic poison. The diagnosis was based on examination of the blood. The azotemia is generally moderate and the Ambard coefficient is high. The amount of uric acid in the blood ranged from 0.007 to 0.015 per cent., reaching 0.028 in 1 case. This form of nephritis is often a result of old or congenital syphilis.

Rathery (Médecine, Mar., 1923) warns against declaring the kidneys healthy because of absence of albuminuria. A severe nephritis may exist without it. He regards albuminuria as of little value for diagnostic and prognostic purposes.

Severe hematemesis was observed by H. F. Shattuck (Amer. Jour. Med. Sci., Feb., 1923) in a personal case, due, as far as could be ascertained, to chronic nephritis with hypertension. A review of the literature furnished several reports of this unusual complication, but gave no uniform conclusions about its cause or pathology.

ETIOLOGY.—Chronic nephritis, according to L. H. Newburgh (Medicine, Feb., 1923), is, generally speaking, caused by the combined effect of infection and abuse of protein, the caloric intake of which is exceedingly low. Among the Bedouins, whose usual diet is composed of a few dates and camel's milk, with rarely any meat, nephritis is practically unknown. Conversely, in the United States, there were in 1915, out of 909,155 deaths, 70,500 which were due to chronic nephritis. Both Europeans and North Americans consume much

larger amounts of protein in the form of animal food than do the native tropical races. Excessive protein metabolism of northern peoples is partly or even largely responsible for the high incidence of chronic nephritis among them.

At the Öresund Hospital for Tuberculosis, C. Holten (Ugeskr. f. Laeg., Sept. 18, 1924) investigated the frequency of renal complications in this disease. In 1917-1921 there were 3619 cases. Among these, 124 (3.4 per cent.) were complicated by albuminuria, nephritis and amyloid disease. Probably only a few of these represented genuine renal tuberculosis; in 45 of the 124 it appeared that the renal disease was due to the tuberculosis.

TREATMENT.—J. S. McLester (So. Med. Jour., Mar., 1923) urges that the food be simple. Pies and other pastries, fried food, and all complex, highly seasoned dishes should be interdicted. To avoid constipation, the diet should include always a sufficient amount of honey, fruits, vegetables, bran and other laxative foods.

An investigation by E. G. B. Calvert and S. W. Lane (Pract., Sept., 1924) showed the effect of a low sodium chloride diet in lowering blood-pressure, even in the absence of apparent renal damage. In chronic interstitial nephritis a reduction of the salt is helpful, while a large amount of salt is injurious. In the various types of nephritis examined, the ability to excrete chloride was least in secondarily contracted kidney, somewhat better in chronic interstitial nephritis, and but slightly subnormal in hyperpiesis. Satisfactory results are obtained when the

quantity of salt taken is reduced to 2 or 4 Gm. (½ to 1 dram) a day for a couple of weeks, then increased somewhat.

Warfield (Jour. Mich. State Med. Assoc., Sept., 1924) also urges the importance of diet in chronic nephritis, viz., a low-protein, moderately high fat and carbohydrate diet, with an abundance of water. It must include all the vitamins; in fact, the antiscorbutic vitamins in oranges, grapefruit and lemons are absolutely essential for the maintenance of the appetite, to say nothing of their specific action. Treatment by drugs is the least important part of treatment. With diet, reduction of the salt, exercise, baths, massage, and sunlight, drugs seem to be quite unnecessary, except, perhaps, iron, mild laxatives, and occasional refrigerant diuretics.

Recalling the favorable results recorded by Heinsheimer, Thévenot, Eppinger and Campanacci, in recognition of Wenckebach's view that severe cases of nephritic edema are due to hypothyroidism, and Guérin's recent labors in the same direction, Fiessinger and Leboucher (Jour. des prat., Sept. 13, 1924) recommend desiccated thyroid gland in doses of 0.03 Gm. (½ grain) 4 to 6 times a day, in cases of edema without hypertension and with much albumin in the urine. This medication is to be continued for periods of 3 weeks.

In advanced cases of cardionephritis with edema—myocarditis, cardiosclerosis, and coronary disease, alone or in combination, with edema of the legs and thighs, general anasarca, secondary hydrothorax and bronchitis, ascites, pulmonary and hepatic congestion,—S. Neuhof (Ther. Gaz.,

Jan., 1924) has found novasurol useful or even life-saving, especially when the usual digitalization and diuretics have failed. The drug is chemically a double salt of oxymercurichlorphenoxyl sodium acetate and diethyl malonylurate, contains about 33 per cent. of mercury, and may be given intramuscularly or intravenously in aqueous solution. It is a powerful diuretic, acting usually within 24 hours, with resulting reduction of edema, visceral congestion, dyspnea and the semistupor from cerebral edema. The 2 contraindications to it are acute glomerulonephritis and enteritis. Good care of the teeth and gums must be taken during its use, and the intake of food and fluid preferably restricted for a few days.

In the *nephrosis* type of renal disease in children, A. Ebel (Monat. f. Kind., Nov., 1924) found large doses of **urea** effectual in causing marked dehydration, even after the ordinary diuretics had failed. The dose used was 50 to 70 Gm. (1% to 21/3 ounces) in children weighing over 20 kilos. (44 pounds).

Calcium chloride has been found by Keith, Barrier and Whelan an active diuretic in nephritis under certain conditions. [See CALCIUM.]

The results of renal decapsulation in 101 cases of chronic nephritis and in 18 of the acute form have been published by Gmelin (Zeit. f. urol. Chir., xiv, 247, 1924). Out of 109 operations, 47 were for "medical nephritis" and 12 of these have been permanently cured for 5 to 18 years and 8 much improved; in 10 cases the patients died with only transient relief from the decapsulation. In 42 cases of hemorrhagic nephritis, 15

were cured or nearly cured, and 8 much improved by decapsulation, and 9 were cured by nephrotomy and 5 improved. In 2 cases the decapsulation or nephrotomy was done on the remaining kidney, years after nephrectomy; both patients have been completely cured for the 10 and 12 years to date.

NEPHROLITHIASIS.—DIA-GNOSIS.—The desirability of early recognition of this disorder, in order to insure its prompt removal in view of the damage done to the renal structures, has been emphasized by various writers. As stated by Sherrill (Med. Jour. and Rec., Jan. 2, 1924), there is possibly no pathological condition in which the diagnosis can be made with more accuracy. H. P. W. White (Brit. Jour. of Surg., July, 1924) states that in the Roentgenography of renal calculi, the opacity of a calculus is determined by the nature of its constituents, its structure and its thickness. Calcium oxalate and calcium phosphate give very good shadows, and are very common constituents of urinary calculi. The high relative opacity is due to the high atomic weight of the calcium present in these salts. All the other common urinary salts give relatively poor shadows. They include the urates, uric acid and triple phosphate. Cystin and xanthin also give poor shadows in the pure state, but of slightly more opacity than the foregoing, owing to the sulphur they contain.

The X-ray is at times the only diagnostic resource. R. Lanzillotta (Jour. d'urol., June, 1924) noted concretions in the kidneys of 9 patients, out of 46 operative cases, in whom pain was absolutely absent. In cases with an

old history suggesting the possibility of renal calculus, or in hematuria with an uncertain diagnosis, and in pyuria, only the X-ray may reveal the renal cause of these phenomena.

Goyena (Presse méd., Jan. 7, 1925) describes a new sign for the diagnosis of latent nephrolithiasis, viz., a severe pain produced by deep percussion in the lumbar region, while the patient is standing, sitting, or slightly bent forward. He strikes with the external or ulnar margin of the hand along the dorsolumbar region from the 8th vertebra downward. The blows cause a stab-like pain when the affected organ is reached. This sign has proved useful in numerous cases.

Even large stones may give little or no sign of their presence, as in the case of one weighing 1 pound, 1½ ounces, reported by R. O. Ward (Brit. Med. Jour., Sept. 23, 1923), which was successfully removed.

ETIOLOGY.—Focal and infections should be given due consideration in the etiology and treatment of nephrolithiasis, according to Keyser, Braasch and other clinicians. Rosenow and Meisser (Arch. of Int. Med., June, 1923) discerned pathogenic organisms precisely where precipitation and crystallization had begun, which points strongly to a local process as the initial factor for the formation of calculi. Streptococci are frequent pathogenic agents in this connection, owing to their elective affinity for the urinary tract, often with focal infection of the teeth as starting point. In 47 cases of renal calculus studied by Bursey (Tex. State Jour. Med., Feb., 1924), focal infection was traced in 32 cases.

Among 20 cases following war wounds observed by H. E. Paul

(Jour. of Urol., Apr., 1923), bone suppuration, including osteomyelitis, carious teeth, etc., was clearly established as the original etiologic factor in 90 per cent. He holds that a history of systemic infection could be elicited in every case. Rovsing (Acta Chir. Scand., Oct. 18, 1924), in 147 cases, found that 71 per cent. of recurrences after operation were also due to infections, mainly by staphylococci.

TREATMENT.—Roysing (loc. cit.) prefers nephrotomy without drainage, and avoids pyelolithotomy as most often entailing a urinary fistula and infection through it, generally with staphylococci. Bacteriologic examination of the urine from both ureters is the criterion for the operation. Where there is unilateral infection and microörganisms are decomposing the urea, and where drainage cannot be avoided, nephrectomy is indicated. In bilateral infections, it is contraindicated. Rovsing (Zeit. f. urol. Chir., Mar. 29, 1923) has also analyzed a series of 716 cases of nephrolithiasis encountered in 29 years, including 2 cases of cystinuria and cystin stones. He ascribes the permanent cure obtained after removal of the large cystin stones to the daily ingestion of 1 or 2 liters (quarts) of distilled water. One patient was a woman; the other, a girl aged 4. The intervals since recovery in these cases were 9 and 4 years, respectively.

If the stone is associated with cystinuria, A. J. Crowell (Jour. of Urol., June, 1924) urges that disintegration be attempted by internal administration of alkalies, pelvic lavage with alkaline solutions, and limitation of protein diet, as was done in 1 case observed by him.

Braasch and Foulds (Ibid.), of the Mayo Clinic, traced the postoperative results in 819 patients operated on more than 2 years, this interval affording a reasonable length of time for possible recurrence. The actual recurrences in the kidney following conservative operation were less than 10 per cent. Many were stones not discovered at the 1st operation. The recurrences in the remaining kidney following nephrectomy were so low (2.75 per cent.) as to indicate that an anatomic factor was present in the affected kidney. The recurrence ratio was greater in cases of single than of multiple stones, and of small than of large stones. It does not vary greatly with the type of operation for the removal of stone, but rather with the operative thoroughness. While pelviolithotomy is the method of choice when possible, the dangers of a limited nephrolithotomy have been exaggerated. Nephrolithotomy is particularly indicated in the presence of cortical degeneration adjacent to the stone. Fluoroscopy has proved to be of great practical value, and no conservative operation for renal lithiasis is complete without it.

In 2 cases, Reschke (Deut. Zeit. f. Chir., May, 1924) drew out the kidney and placed the X-ray plate, wrapped in black paper, in front of or behind it. The patient was then wheeled into the X-ray room. In 10 minutes the finished picture cleared up the diagnosis of renal calculi.

NERVOUS SYSTEM, INJURIES OF.—A comprehensive study of this subject led S. A. Kinnier Wilson (Jour. Amer. Med. Assoc., Dec. 29, 1923) to conclude that, as

an etiologic factor in the production of organic and functional nervous disease, trauma has been overemphasized. He personally followed many cases of soldiers in the British service who received head injuries during the World War, but an intracranial neoplasm did not occur as a sequel in a single instance. War evidence also opposed any traumatic etiology for disseminated sclerosis. As to general paresis or tabes, he believes that unless it can be proved that such symptoms arose within 48 hours of an accident, or that they were augmented within the same period on the evidence of the same physician who had seen the patient on previous occasions, it is illegitimate to argue for a causal relation between accident and symptoms. It has been asserted almost universally that trauma may cause epilepsy, but the author agrees with Turner that "it is difficult to avoid the conclusion that something more than local tissue alteration is requisite for the production of the seizures of traumatic epilepsy, and the determining agent . . . is an inherited or inborn constitutional predisposition to nervous instability and epilepsy." Concerning the relationship between trauma and functional nervous disease, more particularly spinal concussion, the author found that the genuine effects of concussion, spinal or cranial, passed off eventually with a complete return to normal. If they persisted, in the absence of objective change, it could be taken as an infallible rule that the condition had ceased to be one of concussion,

NEURALGIA.—DIAGNOSIS.— Barré and Crusem (Ann. de méd.,

July, 1923) call attention to the fact that the oculocardiac reflex proved negative on the diseased side in trifacial neuralgia, particularly in severe cases. Of 16 patients with unilateral affection of the trigeminal nerve, 9 exhibited a negative reflex on the healthy side. This phenomenon may be likened to the alteration of the tendon reflexes on the healthy side in case of hemiplegia due to a pyramidal lesion, and justifies the conception that there are crossed central connections between each of the centripetal paths of the oculocardiac reflex and the left and right centrifugal paths.

J. B. Doyle (Arch. of Neurol. and Psych., Jan., 1923) considers glossopharyngeal neuralgia a definite clinical entity, differing from trifacial neuralgia only in the area of distribution of pain. According to A. W. Adson (Ibid., Nov., 1924), it is similar to trifacial neuralgia in that the pains are spasmodic, excruciating and lancinating, but they radiate from the pharynx and tonsillar fossa to the The pain is brought on by swallowing or yawning, and lasts for only a few moments; the intermittent periods of pain and ease may continue for a few weeks to several months, but always recur.

The recent procedure of removing cervical sympathetic ganglia in angina pectoris and other disorders may be followed by trifacial neuralgia, as illustrated by 2 cases reported by Pette (Münch. med. Woch., Aug. 1, 1924).

TREATMENT.—Having observed that attacks of severe trigeminal neuralgia developed always from 3 to 5 hours after eating, thus suggesting some kinship with alimentary

anaphylaxis, and after failure of other measures, Robert (Prensa med. Argent., July 10, 1924) obtained a cure under dieting and daily doses of 1.8 Gm. (28 grains) of peptone for 2 weeks.

The remedies credited with "cures" have been as varied as numerous. Purely as a tentative measure, irrespective of any determinable diagnostic evidence, Valls (Semana méd., Aug. 28, 1924), in a severe case of neuralgia of the brachial plexus, tried a course of mercury. The pains disappeared completely for 2 years. Then slight pains returned, but subsided anew under a 2d course, with neoarsphenamin, and there has been no recurrence during the 1½ years to date. The man is now 33 years old, and probably suffered from inherited syphilis.

Lichnitzki (Paris méd., Dec. 20, 1924) recommends the ultra-violet rays in both neuralgia and neuritis. They relieve the pains, and may cure in some instances.

Matoni (Med. Klin., June 29, 1924) reports good results from the **X-rays** in trigeminal neuralgia and sciatica.

Barré (Médecine, June, 1923) used with success in 15 cases of facial neuralgia, and with marked improvement in 9 cases, aconitine ionization, applied every day or every other day from 10 to 80 times, each session lasting 45 minutes. The positive electrode was moistened with a solution of aconitine nitrate, 0.25 mgm. (½60 grain) to 125 c.c. (4 ounces) of water.

Injections of various agents are also recommended. Kulenkampff (Zent. f. inn. Med., Oct. 4, 1924) recommends injections of atropine by the Härtel method. The same observer (Münch. med. Woch., Feb. 6, 1925) endorses the use of atropine internally in small doses for 3 or 4 weeks. A 0.1 per cent. solution is used, beginning with 3 drops 3 times a day and increasing at intervals of 5 days up to 8 drops. The object of this treatment is to reduce the excessive irritability of the sympathetic nervous system.

In neuralgia of the superior laryngeal nerve, Halphen (Bull. Soc. méd. des hôp. de Paris, Feb. 8, 1924) found injections of alcohol into the trunk the only efficient measure of many tried, as well as the least dangerous.

Härtel (Münch. med. Woch., Aug. 8, 1924) has treated 100 cases of trigeminal neuralgia with alcohol injections. He injects the whole Gasserian ganglion in severe cases. Where this procedure was possible, a permanent cure resulted. When the injection was only partial—especially with preservation of the sensibility of the cornea—recurrence was the rule in from 6 months to 4 years. Some of the patients were cured by reinjection.

Philippsthal (Deut. med. Woch., Sept. 28, 1923), in 10 patients with epigastric neuralgia resembling the pains of gastric ulcer, gave marked relief with injections of procaine into the painful spot. The addition of alcohol cured 2 others, while 5 proved refractory to all measures until relieved by excision of the painful spot or seat of the neuralgia. In 2 cases asthma accompanied the attack, and in 4, a tendency to neurasthenia was manifest. Subsidence of the pain after injecting procaine differentiated the neuralgia from organic disease.

Where motion of the nerve is the

source of pain, its liberation is indicated. Thus, Fisher (Arch. f. klin. Chir., cxxv, 749, 1923) reports 12 cases of so-called *epicondylitis* and 7 of *styloiditis*, in which the pains were severe, persistent and rebellious to all usual measures. The cure was immediate and complete, however, when the inflamed or irritated nerve was simply shifted to a more sheltered position, putting an end to its rubbing against the condyle or styloid process.

As stated by C. W. Flynn (Tex. State Jour. of Med., Apr., 1924), major trigeminal neuralgia is best treated by the method of Frazier, of Philadelphia. Of 6 cases, the results were very satisfactory in 5. In 23 cases of tic douloureux, W. T. Coughlin (Ohio State Med. Jour., May, 1924) resorted to section of the sensory root of the Gasserian ganglion inside the skull between the ganglion and brain, with complete success. All the patients are alive and well. F. Krause (Med. Klin., Dec. 9, 1923), in 100 cases, resorted to gasserectomy for trigeminal neuralgia, with a mortality of 11 per The motor and trophic disturbances were less than anticipated. He always tried alcohol injections into the peripheral nerves, preceded by procaine, before undertaking the operation, but he found that repeated injections of alcohol into the ganglion made the operation difficult.

NEURASTHENIA. — According to Gatscher (Wien. klin. Woch., Sept. 4, 1924), the sensation complained of by some neurasthenics, as if the ground were rocking under them when they walk, is due partly to the fact that the height of the

head changes in walking. This causes an increased irritability of the otolithic apparatus, which registers perceptions suppressed under normal conditions.

In a case of true neurasthenia observed by A. Tardieu (Paris méd., Apr. 12, 1924), the condition was a manifestation of the toxic action of diffuse tuberculosis. The morbid depression of mind and body was evidently secondary to the diffuse infection.

M. de Fleury (Presse méd., July 4, 1923) deplores the blunders in treatment in this disease. The soil for neurasthenia is sluggish metabolism, the onset is gradual, generally after some disease, physical overexertion or worry, with hypotonia of the muscles and insufficiency of the endocrine system, circulation, digestion, etc., and a tendency to visceroptosis.

TREATMENT.—Sexual pathology is becoming increasingly complex and encroaching on internal medicine, surgery, legal medicine and psychiatry, according to A. Valerio (Brazilmed., Aug. 16, 1924). He describes 5 cases of impotency or sexual neurasthenia in which a cure seemed to be realized by local treatment of the inflamed or otherwise abnormal verumontanum.

In Lyle's (Brit. Med. Jour., Jan. 17, 1925) opinion, operations are being performed frequently on women from an entirely wrong diagnosis. In many cases a careful examination of the pelvis, and an assurance that the patient has no pelvic disease and the condition is merely due to worry or nervousness or constipation, will make the patient feel quite well. In other cases a mixture of potassium bromide and magnesium sulphate,

together with fresh air and outdoor exercise, telling her not to tire or fatigue herself in any way and to stop worrying, will generally be sufficient treatment.

NEURITIS.—In all of the cases of brachial pressure neuritis described by W. Mercer (Edinb. Med. Jour., Dec., 1923) there were definite signs of pressure on the dorsal root or lower trunk of the brachial plexus of the left side. While the condition was suggestive of the presence of a cervical rib, there were vague shoulder and other pains which masked the typical symptoms of the anomalous rib.

According to H. Herzog (Wien. klin. Woch., Sept. 25, 1924), the nasal etiology of retrobulbar neuritis is worth considering. Moreover, it can be treated. Opening of the ethmoidal cells is indicated. Cocainization of the nose, together with adrenalin, reduces the edema and has a decidedly curative action. The neuritis begins in these cases as a circumscribed meningitis.

L. Stark (Nebr. State Med. Jour., Jan., 1924) administers sodium iodide intravenously. The results are very satisfactory, and he has been able to get a larger amount of iodide into the patient with less gastric or other disturbance than by any other method. From 30 to 120 Gm. (1 to 4 ounces) were given at a time without deleterious effect.

W. B. Jones (Brit. Med. Jour., Jan. 17, 1925) has found that treatment by **electrolysis** gives good promise of relief in cases in which the lesion is of the interstitial type, being the result of inflammation of the nerve sheath.

**MULTIPLE.**—The causes of polyneuritis are many and varied. Thus, G. Wilson and N. W. Winkelman (Jour. Amer. Med. Assoc., May 3, 1924) observed 3 cases, with death in 2, due to gas or carbon monoxide Cornils (Zent. f. inn. poisoning. Med., Dec. 20, 1924) recorded a case due to cholemia with jaundice from occlusion of the common duct. Two cases have been attributed to emetine -an overdose in the case observed by Ardin-Delteil, Azoulay and Salles (Bull. Soc. méd. des hôp. de Paris, Apr. 27, 1923), and therapeutic doses in that described by Louis and Trabaud (Ibid., July 27, 1923), in which the main symptoms were muscular pains. An artificial pneumothorax was the cause of a polyneuritis, which led to both motor and sensory neuritis in the 4 limbs, observed by Lévy-Valensi (Ibid., Dec. 9, 1924), who also reported 2 cases, 1 due to alcohol poisoning and the other to treatment with arsenic.

TREATMENT.—In multiple neuritis, W. Martin (Amer. Jour. of Electr. and Radiol., Dec., 1923) advocates body irradiation with the aircooled quartz mercury lamp. static wave current is then applied as in sciatic neuritis, the patient being forewarned that the soreness may be aggravated for a few days. If neurotic hyperesthesia manifests itself, static treatments are replaced for 1 to 2 days by the high frequency current. This neuritic therapy is usually combined with a 15-minute treatment of wave current applied by the spinal electrode to the lower dorsal and lumbar spine, using a long slow spark. Persons with poor peripheral circulation respond to resonator sparks rapidly applied over the

whole leg and foot surface. The later stage of the treatment, i.e., after the neuritic soreness and pain have been relieved, consists in the use of the galvanic sinusoidal current for 20 minutes at a time if the patient can tolerate it, the dorsal pad being retained by his weight in the recumbent position, and the small pad applied to the foot, usually the sole. When the patient can stand on his feet again, overexertion must be strictly avoided.

NEUROSES.—TREATMENT.— S. R. Roberts (Ann. of Clin. Med., May, 1924) endows psychotherapy with a powerful curative influence, the overwhelming personality of the physician playing a large rôle in the Pleasurable occupations process. which divert the mind are also potent; golf, for instance, has cured many a neurotic. According to Zeehandelaar (Ned. Tijd. v. Gen., Apr. 14, 1923), the question is not whether the affection is organic or functional, but how much of it is organic or how much functional. The mercury lamp, oxygen and other physical measures are often valuable adjuvants, far better than drugs. As the hemoglobin percentage increases, the nervous asthma or other neurosis subsides more promptly under psychotherapy.

NEVI.—The bulk of attention in the treatment of this condition has been centered upon the use of radium. Rulison and S. McLean (Amer. Jour. Dis. of Childr., May, 1923) point out, however, that not all angiomas respond equally well to it. The port wine mark is very obstinate, the flat nevi generally being more refractory than the raised. Many nevi of small

size situated on covered parts are easily destroyed by more rapid The scar following the methods. skilful use of carbon dioxide snow is often insignificant. Telangectasis, classed with nevi, is better treated by Surgery often gives electrolysis. brilliant and rapid results. In certain selected, raised vascular nevi of the face, radium therapy yields results which probably cannot be achieved by other methods, especially if begun in early infancy. H. Morrow and L. R. Taussig (Amer. Jour. of Roentgenol., Nov., 1923) have found that the results are better with radium in vascular nevi than with carbon dioxide snow or any other therapeutic agent. Radium is most satisfactory in treating nevus vasculosus, next in treating cavernous angioma, and is least satisfactory in nevus flammeus. Beta rays should be used preferably. H. MacKay (Can. Med. Assoc. Jour., May, 1924) considers radium the best remedy in superficial vascular nevi. It may be applied during sleep in young children.

NOSE.—The fatalities after operations on the nose were studied by H. Burger (Ned. Tijd. v. Gen., June 2, 1923) on the basis of 66 cases collected by him and Loeb's collection among American surgeons of 190 fatalities after operations on the nose and 142 on the throat. He recalls Ballinger's warning not to operate in the nasal fossæ when there is violent headache unless lumbar puncture shows that there is no danger of an already existing meningitis. Among other formulated rules are that the physician who causes pain in introducing the nasal speculum is not sufficiently trained to attempt even to probe the fronto-nasal passage, and that consultation with the family physician should always precede any operative procedure.

Leonhard (*Ibid.*, May 10, 1924) refers to 1000 cases in which he used, after operations on the lower part of the nose, a condom tampon packed with gauze. The condom fits tightly and keeps the gauze dry, while it does not adhere to the tissues. The projecting portion is tied and cut off. His personal experience with almost sudden hemorrhages after nasal operations has shown the wisdom of prevention.

# sults from the use of pituitrin in cases of asphyxia pallida in newborn children are reported by Cormack (Brit. Med. Jour., Mar. 29, 1924). In the 1st case, a Chinese woman had

NEWBORN, DISORDERS OF.

-ASPHYXIA.-Two striking re-

the 1st case, a Chinese woman had been in labor 2½ days when the physician was called. Upon delivery the child was exceedingly pale and limp, and made no attempt to breathe. Various methods of artificial respiration, tried without result, occupied about 20 minutes, by which time the infant appeared quite dead. The writer then injected 0.3 c.c. (5 minims) of pituitrin into the muscles of the buttock. In less than a minute the child gave a deep sigh, its skin began to flush, and within 5 minutes it was crying and breathing normally. The 2d case was very similar.

E. H. Rainey (*Ibid.*, Apr. 26, 1924) resorted successfully to the intracardiac injection of pituitrin in asphyxia neonatorum in a primigravida whose pelvis was just under normal measurements, but in whom the 1st stage took 15 to 18 hours.

When the head was well down in the pelvic cavity, after 5 hours' delay, the writer applied axis-traction forceps. No force was needed to bring the head into the outlet. The child was born some 10 minutes later in a condition of white asphyxia, with the cord only feebly pulsating. In spite of all the usual measures, the heart failed to become audible. Having no adrenalin with him, but only pituitrin, the writer injected 0.25 c.c. (4 minims) directly into the heart, and continued inflation respiration. Within 1/2 minute the heart began to beat, and so continued with increasing force. With the aid of further forced respiration the child eventually breathed satisfactorily.

In an asphyxiated newborn infant, E. A. Koch (Zent. f. Gyn., Oct. 11, 1924) administered an intracardiac injection of adrenalin 5 or 6 minutes after the heart stopped beating, and was successful in resuscitating the child. Not over 0.5 c.c. (8 minims) should be injected in the newborn, and the injection must be given not later than 10 minutes after cardiac

Oxygen inhalations with a rubber tube inserted into the mouth are advocated by Bakwin (Amer. Jour. Dis. of Childr., Feb. 23, 1923). This measure proved very effective in 2 instances. Holzbach (Zent. f. Gyn., June 7, 1924) found that the intake of oxygen is promoted by light compression of the chest, controlled by the manometer.

CEREBRAL INJURIES.—In the course of a study of birth injuries of the brain, B. Fischer (Schweiz. med. Woch., Oct. 2, 1924) produced such injuries by the application of a suction apparatus on the head of

newborn puppies. All the myelin granules in the glia cells were pathologic. He deems it amazing that any skull is able to stand application of forceps, and concludes that 10 per cent. of deaths during the first month are chiefly due to birth injuries.

SUPPLEMENT.

P. Schwartz (Deut. med. Woch., Oct. 3, 1924) found macroscopic changes in the brain, especially hemorrhages and patches of necrosis, in 65 per cent. of stillborn fetuses and infants less than 5 months of age. He attributes them to an injury during the last stage of birth. A decreased irritability of the vestibular apparatus, similar to that occurring in adults after concussion of the brain, was found in many restless or apathetic infants. Congenital debility and atrophy are too often regarded, according to Ylppö, as causes of death in the 1st month. The brain lesions suffered during labor usually account for it, as well as for such conditions as porencephaly, epilepsy, idiocy and Little's disease.

HEMORRHAGE.-L. A. Wing (Bull. Lying-in Hosp., City of N. Y., Aug., 1923) states that asphyxia of the infant during birth impairs the clotting power of the blood, rendering the child especially susceptible to both immediate and delayed hemorrhagic lesions. Therapeutic measures should be used promptly. The obstetrician should appreciate his responsibility for the early recognition of a hemorrhagic disorder in the newborn.

H. Saenger (Monats. f. Geb. and Gyn., Feb., 1924) observed intracranial hemorrhage in 73 of 100 newborn infant cadavers. The tentorium was intact in but 3 of 46.

straight sinus, the vertex and the tentorium veins seemed to be the most vulnerable areas. In 34 there was no sign of life, but meconium in the bronchi was present and the heart was beating in 24. None of the infants could be revived. The after-coming head showed the greatest injuries.

In the gastrointestinal hemorrhages of the newborn, Vignes (Médecine, Apr., 1923) recommends transfusion of mother's blood in severe cases. He injects slowly 20 c.c. of blood into the sagittal sinus at the posterior angle of the anterior fontanel. In 6 out of 9 severe cases thus treated, the infants recovered, although as a rule the mortality in such cases is 50 per cent.

[See also Cerebral Hemorrhage in the Newborn.]

JAUNDICE, OR ICTERUS NEONATORUM.—In a general review of this subject, P. Schwartz (Zeit. f. klin. Med., May 15, 1924) concludes that hemolysis, i.e., destruction of the red corpuscles, is the cause of this condition. In accord with this view, Pollitzer (Pediatria, Jan. 15, 1924) found autohemolysins in the serum of those jaundiced newborn who showed increased resistance of the erythrocytes, while these lysins were not demonstrable if the resistance was lowered. He concludes that fixation of the lysin on the erythrocytes is the cause of the phenomenon.

On the plea that hyperacidity is often the cause of jaundice in the newborn, R. A. Poynton (Ill. Med. Jour., June, 1924) administers an antacid solution of sodium bicarbonate in these cases, apparently with good effect.

NURSING.—In a study of the influence of diet on lactation in over 400 cases, E. L. Adair (Amer. Jour. of Obst. and Gyn., Jan., 1925) found that an excess of food did not increase milk production. The milk ingestion and weight-increase of the infants in the neonatal period tend to indicate that the milk secretion increases more steadily on rations that contain a liberal proportion of protein. This high protein and balanced diet seems to meet the needs of the mother and infant, without excessive calory intake, better than either the high fat or high carbohydrate diet. Liberal protein feeding proved to be of definite value in securing the maximum milk production.

In 1 of Marañon's cases (Rev. med. de Barcelona, Jan., 1924), premature menopause developed after the woman's 3d pregnancy at the age of 35. She nursed her infant for 14 months, but the mammary secretion persisted unmodified for 4 years after the birth of her child, and then gradually stopped. No form of organotherapy or other measures had any apparent effect on the lactation. In a 2d case, a phantom pregnancy was accompanied by profuse lacteal secretion which has persisted for 2 years to The woman is now 29 and seems otherwise healthy. This is evidently due to some endocrin anomaly on a psychic basis. Menstruction has not returned in this patient.

Contrary to popular belief, Birk (Monats. f. Kind., Mar. 25, 1923) found that even after 3 years of nursing human milk contains a sufficient amount of food and salts for the child's needs.

0

OBESITY.—SYMPTOMS AND ETIOLOGY.—The basal metabolism of obesity in adults has received considerable attention of late. In 21 adipose hospital patients taken at random, E. O. Folkmar (Ugeskr. f. Laeg., Oct. 9, 1924) found the metabolic rate diminished from 3 to 20 per cent., as calculated from Benedict's tables. The lowest pulse-rate taken during the experiments was always greater than the lowest observed in the patient at other times. The pulserate runs parallel with the more or less complete rest of the adipose patient. He thinks that the values in the obese do not represent the actual basal metabolism. Although the adipose individual eats more than he can use, he really eats but little, because his active mass of protoplasm Strouse and Dye is very small. (Arch. of Int. Med., Sept., 1924) recognize the existence of a constitutional obesity in which there is no interdependence between food intake, energy expense and weight. Underweight in otherwise healthy persons also occurs even when the caloric intake is more than sufficient to supply energy demands. Their data tend to prove that certain types of obese persons maintain their weight without regard to the usually accepted caloric balance.

In a study of 1000 cases recorded in life insurance tables, W. E. Preble (Boston Med. and Surg. Jour., Apr. 26, 1923), noted that the *blood-pressure* was usually high, and that it fell with decreasing weight. Of the 1000 cases studied, 432 gave evidence of organic heart trouble and 230 of functional disease; 463 gave evidence of

kidney impairment; 53 cases out of 700 showed sugar in the urine. The basal metabolism was, however, found within normal limits. As to mortality, studies based on more than 250,000 overweight people showed that up to 10 pounds there is no increase in mortality, but above that figure the mortality rises steadily. There is, however, no marked increase in mortality up to the age of 25 even in the very obese. At 25 the mortality rises from 15 pounds overweight and upwards, and at and beyond the age of 40 the rise in rate is rapid, increasing with the rise in overweight. There is in the figures given a decrease in mortality after the age of 50, probably owing to the fact that this study was made on the insured, and that after 50 the companies are loath to insure people who exhibit overweight, only exceptionally good risks being accepted.

According to Aubertin (Médecine, Mar., 1923), hypertension in stout persons is a complication, not a sequela of obesity, and may be the cause of severe incidents such as apoplexy, sudden death, etc.

G. E. Brown and N. M. Keith (Arch. of Int. Med., Feb., 1924) found that the circulating blood and plasma volumes when compared to body weight were smaller in obese than in normal subjects. Loss of weight in the obese did not always modify the blood and plasma volume or the percentage of hemoglobin or red corpuscles. In 3 cases, following loss of weight there was evidence of blood dilution, but no definite evidence of anemia. When a marked

decrease of weight occurred, there was evidence of anemia.

A. Willemse (Ned. Tijd. v. Gen., Jan. 27, 1923) has observed that in women, just above the wrist, there is often a local accumulation of fat, and another close to the lower jaw, which seem to be peculiar to the approaching menopause, and may warn of its imminence.

TREATMENT.—Weiler (Rev. med. del Rosario, Dec., 1923) holds that obesity, angina pectoris, hypertension, etc., are linked together by a common factor, the lack of the insulin hormone. The consequence is defective ultilization and abnormal deposits of fat. This may be combatted by dropping carbohydrates and giving insulin. Glycosuria, according to his conception, is a defensive phenomenon (except in renal diabetes), the consequence of the insufficiency of insulin production. Strict avoidance of carbohydrates and artificial supply of insulin proved brilliantly successful in 12 cases treated by him.

A. Alexander (Deut. med. Woch., Mar. 7, 1924) deems treatment of obesity with extracts of single organs, such as the thyroid or ovary, illogical, and has found it unsatisfactory. He has long used lipolysin (Herring) with good results. Lipolysin is a mixture of the extracts of the thyroid, hypophyseal, pancreatic and genital glands. There is a lipolysin masculin, containing an extract of the testicle, and a lipolysin feminin, containing an extract of the ovary. Lipolysin causes at first a marked diuresis and relief of the spastic constipation which is commonly found in these cases. During the early part of the treatment the fluid intake should be reduced, and carbohydrates and fat restricted. The best diet is one containing an abundance of vegetables and meat. The most satisfactory results with the use of lipolysin were obtained when injections of the mixture were given every other day and 2 tablets by mouth on the intervening day. When 12 injections have been given the tablets are administered by mouth only, unless there is an increase in weight or swelling of the tissues. A total of 24 to 30 injections and from 120 to 150 tablets may be given without danger. At the termination of the regular treatment, 2 to 3 injections may be given before the menstrual periods to relieve the dysmenorrhea and prevent a recurrence of the pluriglandular insufficiency of menstrual origin.

The following diet is recommended by Hatiegan (Vienna Letter, Boston Med. and Surg. Jour., Dec. 18, 1924): Breakfast, 7.30 A.M.—Cold lean meat, 2 to 4 ounces (60 to 120 Gm.); 2 drams (8 Gm.) of bread; a cup of weak tea, without sugar or milk. 10 o'clock—1 egg, without bread. 12 o'clock-Roast or grilled meat, 2 to 4 ounces (60 to 120 Gm.), without gravy or sauce; green vegetables ad lib. without butter or grease; weak tea, without sugar. 4 o'clock—A cup of tea, without sugar. 7 o'clock-2 eggs, green vegetables, 1 ounce of bread, weak tea. A walk is taken after each of the principal meals. The patient will lose 20 to 24 pounds in 25 days. The rigor of the régime may then be lessened, the quantity of bread increased, and a little butter allowed in the vegetables. some months on this régime, the patients will have lost from 40 to 50 pounds in weight, whereupon the

dyspeptic troubles, oppression and bronchial catarrh from which they generally suffer will have practically, if not entirely, disappeared.

In cases with abnormally low basal metabolism, according to H. Zondek (Klin. Woch., May 13, 1922)—the thyroid and genital forms—success can be attained only by increasing oxidation. In dystrophia adiposogenitalis and in localized lipomatoses, the latter





Fig. 1.

Pituitary obesity. (Engelbach, in Ann. of Clin. Med.)

of which involve no glandular abnormality, endocrin preparations have little effect on the adiposity. In the author's experience, the most useful preparation, where thyroid is indicated, is thyroidin in amounts of 3 to 9 grains (0.2 to 0.6 Gm.) a day, continued till quickened pulse and heart-beat, abundant perspiration and general nervousness give warning of full effectiveness. In adipose conditions not of thyroid origin, ovarian and pituitary preparations are to be employed, but they quicken meta-

bolism to a less degree than thyroid extracts. Often a combination of thyroid, ovarian and pituitary may be found effective to that end.

In a review based on a careful, critical study of juvenile obesity, Engelbach (Ann. of Clin. Med., Sept., 1924) summarizes his conclusions concerning the age incidence in its relation to obesity of endocrin origin as follows: (1) Overweight at birth indicates hypothyroidism; (2) overweight in the juvenile life indicates insufficiency of the posterior lobe of the pituitary; (3) gonadal adiposity never occurs at birth or in the juvenile age, but is always limited to the post-adult age (after 34); (4) post-adult adiposity need not be limited to gonadal insufficiency, but might be due to hypothyroidism, hypopituitarism, hypogonadism or, as is frequently the case in protracted cases, a combination of 2 or 3 of these endocrin deficiencies. Engelbach holds that no other endocrin disorder will produce a marked adiposity in the juvenile age, although not all juvenile adiposities are due to hypopituitarism, but he estimates that between 70 and 80 per cent. of them are of pituitary origin. In such cases pituitary whole gland substance, 10 grains (0.65 Gm.) in salolcoated capsules after meals, and what the author terms "a tolerant dose of pituitrin hypodermically" twice weekly, are serviceable.

The annexed illustrations indicate the type referred to in which both lobes of the pituitary are functionally inadequate. Figure 1 represents a girl of 13 years in whom the pituitary treatment had just been started. Figure 2 represents a girl of 15 years, a case of the same class, though per-

haps less marked, in which the treatment described had restored normal body conformation, reduced the weight 17 pounds and caused the menstruation, which had been very irregular, with prolonged absences, to become regular.

OCCULT BLOOD.—Snapper (Arch. des mal. de l'app. dig., Oct., 1924) states that spectroscopic examination of the feces for occult bleeding is not of great diagnostic value in ulcer cases. The most sensitive methods are negative in 25 per cent. of the gastric or intestinal ulcer cases, and are positive in 40 per cent. of other diseases, even on a diet free from meat and vegetables. In malignant tumors, there are regularly considerable quantities of blood in the feces. It is, however, necessary to test for hematoporphyrin, because the blood may be decomposed to that stage. While the absence of a spectrum of hematoporphyrin testifies against a malignant tumor in the stomach or intestine, its presence does not prove the existence of malignant disease.

In testing for occult blood, J. Vandorfy (Arch. f. Verd., Dec., 1923) uses the Schroeder modification of the Weber guaiac reaction. There is added to the feces tincture of guaiac in 3 different concentrations, viz., a wine-yellow concentration, a straw-yellow concentration, and finally a clear concentration of guaiac resin in alcohol; 20 drops of 3 per cent. hydrogen peroxide are then added, and 5 to 10 drops of glacial acetic ether extract.

Ratnoff (Zeit. f. Kind., Jan. 18, 1923), recalling Rumpel-Leede's phenomenon, refers to his frequent observations of intestinal bleeding in children in the second ½ of the first year and the beginning of the second, and states that this age predisposes also to cutaneous hemorrhages.

**OPHTHALMIA.**—Lehrfeld (Atlantic Med. Jour., May., 1923) traced 49 cases of *ophthalmia neonatorum*; 2 were blind, 1 partially blind in 1 eye, and 3 had marked disturbances of vision. A prophylactic had been used

in only 20 instances out of 35 in 1920, and in 22 instances out of 33 in 1921. If such omission occurs among the actual gonorrheal cases, there must necessarily be a large number of babies born annually who do not receive the benefit of this all-important prophylactic measure. According to Norrie (Ugeskr. f. Laeg., Aug. 16, 1923), the Credé silver nitrate instillation was made compulsory in Denmark in 1900. In the 20 years before this, 13.7 per cent. of the 365 inmates of the blind asylum were accounted for by ophthalmia neonatorum; this was reduced in the 20 subsequent years to 8.8 per cent. of 372 inmates. Since 1905, there have only been 8 cases in all.

In a series of 20 cases of sympathetic ophthalmia, Guiral (Rev. de Med. y Cir. Havana, Apr. 10, 1923) used parenteral injections of the patients' own serum, unheated, with success. The injections were made daily or every other day, and the dose was 3 c.c. (48 minims), the improvement serving as gauge for the number administered. The author believes that his results sustain the anaphylaxis theory of sympathetic ophthalmia.

ORCHITIS.—A case of orchitis due to *B. typhosus* infection was observed by G. A. Durnin (Journament, Dec. 15, 1923) in a robust man, aged 35, who had sustained an injury of the left testicle while climbing over a wire fence. The injured testicle presented hard nodular areas with 2 distinct areas of softening. A Widal test was negative. As the lesion was considered to be tuberculous, he was treated accordingly. Several weeks later an abscess in the opposite testicle was evacuated.

Culture from this pus revealed typhoid bacilli; later this organism was found in the urine. Further treatment was by typhoid vaccines, which resulted in gradual clearing up of the lesions, leaving hard nodules at the sites of the abscesses. Previous to his injury this patient had been using drinking water from a well which later was found to be the source of a local epidemic of typhoid fever. He did not, however, at any time present symptoms of the disease.

Torsion of the testicle is often responsible, according to A. Mouchet (Presse méd., May 30, 1923), for acute epididymitis and orchitis in boys. He has operated for this cause in 5 cases in less than 2 years. In 2 boys the symptoms were less severe, and the operation revealed torsion of the hydatid of Morgagni instead of torsion of the testis.

ORIENTAL SORE. — Castellani (Jour. of Trop. Med. and Hyg., June 1, 1923) referred to 7 cases in which phosphorated oil had cured this disease. Additional details by the same observer (Ibid., Oct. 1, 1924) state that the oil (Oleum phosphoratum, B. P.) is applied externally to the sore and given by injections (3 to 5 minims— 0.18 to 0.3 c.c.) into the nodule and under the skin around it. When the ulceration is fairly developed, the simple external application of the oil, after removing the scab, without any injection, suffices to cure. In certain cases of the nodular type, it is not essential to inject the oil into the nodule, the subcutaneous inoculation in the close vicinity being sufficient.

**OSTEOMALACIA.**—The prevalence of this disease among men as

well as women during the World War and during the famines in China has indicated that it must be placed among the deficiency diseases. Miles and Feng (Jour. of Exp. Med., Jan., 1925), of Peking, found the serum of such cases deficient in calcium and in some instances, of phosphorus, according to the severity of the disease and its duration. Adequate food brought relief.

In a series of 28 cases, some in men, Buckhardt-Socin (Arch. f. Gyn., cxxi, 61, 1923) noted, as initial symptoms, constant tenderness at the symphysis, along the pubic arch, especially on its inner aspect, and at the spinous processes of the 3d to the 8th thoracic vertebræ and the sternum. Sitting was frequently painful on account of the sensitiveness of the tuberosities of the ischia.

E. Scipiades (Zent. f. Gyn., Aug. 30, 1924) resorted to thymus grafting in a case of osteomalacia which had begun during the patient's 8th pregnancy and had progressed for 2 years. The grafts, obtained from the thymus of a female newborn infant, were implanted in the abdominal wall. The results are stated to have been as good as those obtained from ovariectomy. The intense pains disappeared on the 4th day after the operation, and on the 10th day the patient was able to walk. writer holds, after an experimental research, that osteomalacia is due to deficient activity of the thymus. There has been no recurrence during. the 3 or 4 months to date.

osteomyelitis of the upper jaw in infants is more common, according to G. H. Nord (Ned. Tijd. v. Gen., Mar. 29, 1924),

than would be assumed from the few cases on record, 32 up to 1914,—with 50 per cent. mortality. He has himself encountered 4 cases within 18 months and knows of 9 other cases in the Netherlands since 1919. It may appear as early as the 2d to the 10th week. There may or may not be swelling of the cheek, edema of the lower lid, exophthalmos and invasion of the ethmoidal or sphenoidal sinus. If it is left untreated, there may be metastases in the lung, heart, meninges or long bones.

In 2 instances of osteomyelitis of the clavicle observed by Viola (Rif. med., May 26, 1924)—1 probably tuber-culous,—both patients complained of intense pains in the shoulder, probably due to pressure on the brachial plexus.

Rocher (Paris méd., July 21, 1923) observed a case of acute osteomyelitis of the patella in a boy aged 13, characterized by sudden onset and rapid course. The joint was full of staphylococcal pus 8 days after the 1st symptom. The writer has collected 50 cases of the same type. There was a history of trauma in 24, but usually the infectious process developed spontaneously. The osteomyelitis was acute in all but 5 cases. The operations were completely successful in 24; in 10 there was more or less stiffness, and in 3, complete ankylosis. Regeneration of the patella may be anticipated when the cartilage protecting the cavity of the joint and the fibrous periosteal envelope have been saved.

F. W. O'Brien (Boston Med. and Surg. Jour., Sept. 11, 1924) points out that absence of demonstrable bone changes in the Roentgenogram is the rule in acute osteomyelitis. TREATMENT.—As soon as a case of osteomyelitis of the ordinary staphylococcal type is seen by J. Fraser (Brit. Med. Jour., Oct. 4, 1924), vaccine treatment is begun. Until an autogenous vaccine is available, a stock staphyloccal vaccine is used. An initial dose of 200 million is given; on the 3d day a dose of 400 million is used, and this is repeated on the 5th day; thereafter the autogenous vaccine is given every 4th or 5th day.

Rovsing (Hospitalstid., Aug. 8, 1924) deems it advisable not to add to the antibodies which a vigorous organism is producing during the acute phase of osteomyelitis. acute process damages the tissues irreparably in a few hours, and vaccine therapy is impotent to prevent this. But when the process has passed into a chronic torpid phase, then vaccine therapy may usefully reinforce the antibodies. In 20 of 23 cases of refractory osteomyelitis, staphylococci were the pathogenic agents, and typhoid or paratyphoid bacilli in the others. In all the cases the vaccine induced an amazing change for the better at once, and the disease, often of 10 to 20 years' standing, healed promptly and completely. The great mission of vaccine therapy in this field of osteomyelitis has been confirmed in the last 7 years.

OTITIS MEDIA.—Barajas y de Vilches (Siglo méd., May 5, 1923) irrigates the ear with a hot solution of zinc sulphate, 3.75 Gm. (58 grains), in glycerin, 60 Gm. (1½ fluid ounces), and water, to make 2 liters (quarts). Then he leaves 2 or 3 c.c. (32 to 48 minims) of the tepid solution in the

ear and introduces a zinc wire electrode, the patient holding the negative electrode in his hand. In 6 cases of chronic purulent otitis media treated in this manner with a 2 milliampère current for 10 to 13 minutes, the ear dried up completely in 2 days in some; in others, the sitting had to be repeated. The value of this treatment was illustrated by V. Schmidt (Hospitalstid., Sept. 5, 1923), who had 51 cured and 27 improved among 93 cases of acute or chronic otitis media treated by zinc ionization.

Twelve cases of diphtheritic otitis media are reported by W. J. Mellinger (Cal. State Jour. of Med., Apr., 1923). In 11 the diphtheria bacillus present was of a non-virulent type. All the patients recovered promptly under frequent ear instillations of 60 per cent. alcohol, with a few drops of 25 per cent. argyrol dropped into the nostril on the affected side.

A patient with a chronic suppurating ear should always be tested for tuberculosis, according to G. T. von Codlitz (Ann. of Otol., Rhinol. and Laryng., Mar., 1923). The Moro or Pirquet test may be used in children and the intracutaneous test, in either children or adults. When the reaction is positive, tuberculin treatment should be given, even though other bacteria are present in the discharge. Such patients should be impressed with the fact that the prognosis is good if the treatment is taken regularly. Very often it is found that 1 or both parents of the patient died of tuberculosis and that the discharging ear dates back to that time.

Conservative surgical methods in *chronic* otitis media, in preference to the radical mastoid operation, have given good results in the experience of A. Blalock and S. J.

Crowe (Arch. of Otolar., Mar., 1925). Upon thorough removal of the infection in the mastoid cells, the passage from the antrum to the middle ear is enlarged as much as possible by removing the cells in the posterior part of the zygoma. This permits through-and-through irrigation of the middle ear cavity with Dakin's solution, the fluid entering it from the antrum and coming out into the external auditory canal through the defect in the drum. Mercury bichloride, 1:10,000, or silver nitrate, 1: 1000 may also be used. No packing or drains of any kind are used; cotton applicators for cleansing must be sterile, and the skin about the wound is shaved frequently for 3 weeks after the operation. Of 86 long-standing cases, 28 were freed of discharge and in 39 more the discharge was greatly reduced. The hearing was definitely improved in 60 per cent.

## OVARY .- THERAPEUTICS .-

Seckinger (Amer. Jour. of Physiol., Nov., 1924) has observed experimentally that corpus luteum exercised a marked effect on the contractions of the Fallopian tubes. The interoestrous contractions were markedly affected, their amplitude being increased and their rate decreased. The oestrous contractions were even more definitely affected.

S. H. Geist and W. Harris (Endocrinol., Jan., 1923), using the ovarian extracts of several commercial laboratories, tried experimentally to ascertain their value. It is a well-established fact that after castration a definite atrophy of the uterus takes place; the authors used this phenomenon as an indicator by administering the preparations intravenously to ascertain whether atrophy could be prevented or minimized, or, if possible, hypertrophy obtained. At the same time the breasts were also observed, as well as the thyroid, hypophysis and adrenals, to determine if these preparations had a definite effect upon any of them. Proper controls were instituted. authors concluded that the injection of commercial ovarian extract did not prevent the atrophy of the uterus following castration in rabbits, and that therefore there was nothing in these preparations sufficiently active that would substitute for the

hormone which normally maintains the nutrition of the uterus.

At present, according to J. Rogers (Med. Jour. and Record, Jan. 2, 1924), the only definite symptoms for which there is reasonable prospect of benefit by the administration of ovary are: (1) The hot flashes of the natural or artificially induced menopause and sometimes the accompanying high blood-pressure; (2) the pains of purely functional dysmenorrhea; (3) an occasional functional amenorrhea if the medicament contains derivatives of the corpus luteum. The best form in which the ovarian material can now be administered seems to be a glycerin extract of the fresh pig ovary.

FUNCTIONS.—Histologic examination of 75 pairs of ovaries removed surgically by Doléris (Gynécol., Mar., 1923) revealed lipoid masses apparently formed of spongy cells filled with fat and having a small pyknotic nucleus-the senescent cells. During gestation such cells contained much lipoid, but after the 3d month, this became less plentiful. Their lipoid content was stained with osmic acid and Nile blue. The writer holds that while the ovary regulates puberty and the changes in the uterine mucosa in menstruation and fecundation, the menstrual flow is not caused by the ovary at all, but merely indicates a shedding of the mucosa due to absence of conception. Its activity is restricted to reproduction.

Doléris (*loc. cit.*) does not accept the ovarian theory of essential uterine hemorrhage. He regards all such syndromes as proceeding from metrosalpingitis or from the pseudometritis of uterine sclerosis, uterine arteriosclerosis, and mucous hyperplasia. He bases this view on the fact that there is no direct and constant relation between metrorrhagia and the abundant glandular structure of the ovary. Neither is uterine hyperplasia related to the ovary: It is a true neoplasia which, once formed, possesses the property of persisting.

TRANSPLANTATION.—After an experience based on 23 operations, Tuffier (Surg., Gyn. and Obst., Oct., 1924) deems it justified to transpose an ovary with its pedicle into the uterine cavity to preserve menstruation and the possibility of impregnation in women who have undergone

double salpingectomy. Sterility due to lesions which are seemingly benign or unrecognized is so frequent that it opens up a possibility for the application of this operative measure. In the 23 operations he has had no deaths. There were 2 postoperative hemorrhages from the section of the broad ligament on the opposite side. He did a laparotomy, and after arrest of the hemorrhage both patients got well. The after-results were excellent in 21 instances.

To improve conditions where infantile genital organs and premature menopause prevented normal functions, P. Sippel (Arch. f. Gyn., May 12, 1923) tried ovarian extract by mouth or injection, but always failed. Nor was anything observed suggesting rejuvenation in the Steinach sense. Transplantation of ovaries was then done in 57 cases. In 9, the woman's own ovary was reimplanted; this almost always warded off the premature menopause. The results were very satisfactory in 16 of the remaining 48; in 15 no effect was apparent; in 3 the graft sloughed. The effects did not become manifest from several weeks to 6 months after the grafting. In all the cases of failure, the graft had been entirely absorbed and nothing remained but fibrous tissue. The writer concludes that the outlook is promising with homotransplants of ovary in cases of infantilism and deficient ovarian functioning; also to ward off a premature menopause after castration, and in certain cases of premature menopause and premature senility. The influence from the autograft generally dies out in from 1 to 3 years; with homotransplants it does not last more than a few months. If no effect is apparent, a 2d grafting may prove successful. The outlook is less favorable when the entire genital apparatus shows infantile conditions and when the thyroid is also defective. There is often a tendency to obesity, pasty face and puffy eyelids, with total amenorrhea. No benefit was ever observed from ovarian transplantation in such cases, even with supplementary thyroid treatment.

A case of autoplastic ovarian transplantation was reported by Nattress (Brit. Med. Jour., June 23, 1923) in which the patient is still in a healthy condition after 9 years and 7 months. The sexual life has

been quite normal and the grafted ovaries apparently carry on their functions quite as well as normal ones.

CYSTS.—An ovarian cyst in a child of 6 years was observed by H. T. Wilson (Tex. State Jour. of Med., Aug., 1923), pain in the left lower quadrant, with slight tenderness, being the only early symptoms, soon followed by distention and greater tenderness. Celiotomy revealed cloudy and bloody fluid in the abdomen and considerable distention of the small intestine. The omentum was held fast to the edge of the pelvis by adhesions posterior to the adnexa. When these adhesions were freed, the constricting effect of the omentum on the intestine above was relieved. Pelvic exploration revealed a mass about the size of a lemon on the left side, gangrenous and already becoming necrotic in parts. The pedicle had become twisted 4 times, strangulating the Fallopian tube as well as the ovary.

That ovarian cysts may occur at an advanced age was illustrated by an instance reported by N. Buendia (Rep. de Med. y Cir., xv, 340, 1924), in which torsion of the cyst compelled surgical intervention in a woman of 85. A 2d cyst was also found on the other side.

What is probably the largest tumor of its kind removed intact under local anesthesia was described by E. L. Stone (Amer. Jour. of Obst. and Gyn., Sept., 1924). The tumor, a multilocular ovarian cyst, contained 57 liters (over 14 gallons) of fluid.

Having resorted without success to various measures in the treatment of sclerocystic ovaritis, V. Amenábar (Semana méd., July 12, 1923) drew up the ovary and with the tip of

the actual cautery punctured every palpable cyst. Within a year 20 of the 25 patients thus treated complained of recurrence of symptoms. Thereafter partial resection was tried, but recurrence soon followed in 20 of the 41 cases thus treated. Recurrences followed, however, in only 2 of the 10 cases in which ligamentopexy had been done in addition, suggesting that checking the circulation might tend to prevent recurrence. This measure proved, indeed, curative in 2 of 37 cases thus treated. The author ligated 1/2 of the arteries entering the hilum of the ovary, and the results confirm the assumption that congestion of the organ is the main factor in this class of growth.

OXYURIASIS.—Having learned of the beneficial effects of fresh blueberries in helminthiasis, Nyberg (Finska Läk. Handl., May-June, 1923) ascertained that some patients were actually freed from the helminths by this simple remedy and that there had been no recurrence during the year in some, while in others the oxyuriasis returned, possibly through reinfection. He then treated 11 patients with good results in all known instances. Large children and adults were told to eat 0.5 liter (1 pint) of fresh blueberries 3 or 4 times on the 1st day, and for the next 6 days, once daily.

OZENA.—J. Cisler (Casop. lek. cesk., Aug. 16, 1924), from a study of the bones in 76 patients with ozena, concluded that their condition could be explained as a sequel of the atrophic process in the nose, and that there was no reason to assume that the changes were primary and predisposed to the disease.

TREATMENT.—According to Greif (Ibid., Aug. 9, 1924), the good results of vaccine therapy in ozena are due to a non-specific protein effect. Rebattu and Proby (Jour. de méd. de Lyon, Dec. 20, 1923) advocate local vaccine treatment in ozena. They use autogenous vaccines containing 2 or 4 billion killed bacteria per cubic centimeter. The stronger vaccine is sprayed into the nose on alternate days, while the weaker vaccine is injected under the mucosa of the turbinates, after a preliminary thorough cleansing of the latter. Of 8 patients, 4 were cured and 3 considerably improved.

Rezende and Cordeiro (Brazil-méd., June 30, 1923) are of the opinion that no other treatment of ozena has cured such a large proportion of cases as Lautenschläger's operation. They employed it in 40 cases, supplemented by Seiffert's U silk stitches for fixation of the mobilized walls. The outcome proved satisfactory in 70 to 80 per cent. of the cases. Hinsberg has similarly reported 40 cured out of 59 cases.

To narrow the nasal passages in ozena, G. Spiess (Zeit. f. Hals.-Nasen- u. Ohrenh., Feb. 24, 1923) injects 8 to 10 c.c. (2 to 2½ drams) of the patient's own blood, freshly drawn from a vein of the arm, under the anesthetized mucosa or perichondrium of the turbinates and septum. Becoming organized, the blood mass leads to a lasting protrusion of the area injected.

## P

PAIN.—The use of paravertebral injections of anesthetics to relieve pain by excluding the rami communicantes of corresponding segments or areas supplied by them was introduced by Laewen, who also employed this measure to reduce the rigidity of muscles of the abdomen, e.g., to facilitate palpation. Thus, the intense, colicky pains about the gallbladder as well as the local sensitiveness to deep palpation are overcome by injecting, say, 15 c.c. (½ ounce) of a 0.5 per cent. solution of procaine around the 10th thoracic nerve on the right side of the spinal column.

Brunn and Mandl (Wien. klin. Woch., May 22, 1924), in using paravertebral injection (10 to 15 c.c.—

1/3 to 1/2 ounce—of 0.5 per cent. procaine) for therapeutic purposes, insert the needle at the level of the

corresponding spinous process, 3 cm. from the spine. The transverse process is reached at a depth of 3 to 6 cm., according to the thickness of the soft parts. In the lower thoracic column the spinous process corresponds to the transverse process of the next vertebra below. If the needle has passed above the upper border of the transverse process it is brought out of the sagittal plane at an angle of 20 to 30° to the spine, and pushed forward 2 to 3 cm. in this plane. The injection is then made, with care not to enter a vessel or the spinal canal.

The writers employed such injections at the level of the 9th right spinous process in 10 cases of *cholecystitis*. The attack being due to spasm of the bile-ducts, they 1st tried intravenous injections of **novatropine** and

papaverine. In cases of overdistended gall-bladder these injections had no effect; therefore paravertebral anesthesia was used. The pain disappeared entirely some seconds later, the wall of the abdomen becoming soft. In all of 7 cases except 1, there were no new attacks for as long as 8 months. In 2 cases of renal colic, injections were made on the right or left at the 12th dorsal vertebra, with good results. These observers have also used paravertebral anesthesia in 6 cases of angina pectoris and aortalgia. [See Angina Pectoris.]

W. von Gaza (Arch. f. klin. Chir., Nov. 24, 1924) relieved 30 patients with intense pains in a Head's zone by paravertebral infiltration of the nerves with 15 c.c. (1/2 ounce) of a 0.5 per cent. solution of procaine. The relief persisted for months in some. In 3 cases he employed resection of the paravertebral nerves or rami communicantes in the treatment of vegetative neuroses of abdominal organs after the procaine injection had abolished the pains-thus localizing their source. Severing the rami communicantes abolished the crises on the same side in a case of tabes.

## PANCREAS. - PHYSIOLOGY. -

To the functions attributed to the pancreas, *i.e.*, the secretion of trypsin, lipase and amylase, must now be added the production of the internal secretion insulin, isolated by Banting and his co-workers, which, as stated by Macleod, Banting and Wilder (Jour. Amer. Med. Assoc., Oct 4, 1924) regulates the process of carbohydrate metabolism. When insulin fails to be secreted, there develops diabetes (q.v.), in which the percentage of sugar in the blood is increased (hyperglycemia), so that the sugar overflows into the urine. Administration of insulin should invariably be supplemented by a proper control of the diet.

Insulin prevents the symptoms of acidosis and coma, removes them if present, and minimizes the risk of surgical operations which end fatally in untreated diabetes.

THERAPEUTICS. - Pancreatic preparations are valuable in the treatment of conditions resulting from a failure of the external pancreatic secretions as well as in the treatment of diabetes resulting from a failure of insulin. In digestive disturbances attributable to diminished or absent pancreatic activity, the need for the oral administration of pancreatic ferments is problematic [not according to the experience of clinicians] and the utility of pancreatin, desiccated pancreas and analogous preparations is doubtful, according to Wilder, who also states that in diabetes, reliance on the oral administration of the pancreatic preparations thus far prepared has so little justification that such practice deserves condemnation. Purified extracts, containing the internal secretion of the pancreas (insulin) and suitable for subcutaneous injection, have a prompt and powerful action when so administered, but appear to be without significant effect when given by other routes. The Toronto insulin unit, the univeral standard, will promote the metabolism of approximately 2 Gm. of glucose in uncomplicated cases receiving standardized diabetic diets. When complications are present, especially infections, and in the presence of diabetic coma, doses of 15 to 30 units are given at intervals of 3 to 6 hours, accompanied by oral administration of easily available carbohydrate. Transplantation of pieces of pancreas from an animal of 1 species to an animal of another species invariably results in rapid atrophy of the graft. This precludes the possibility of successful treatment of diabetes in human beings by such means.

PANCREATITIS.—R. Vogel (Deut. Zeit. f. Chir., Apr., 1924) comments on the frequency of error in the diagnosis of this disorder. Out of 55 cases of acute pancreatitis seen by him, gastric ulcer had been assumed in 9 and cholecystitis in 16. In 42 per cent. of the total cases

there were complications in the biliary passages. In 2 cases there had been a contusion, and in 3 child-birth had preceded the pancreatitis. Nearly all the patients displayed a tendency to obesity.

Delbet (Bull. de l'Acad. de méd., May 27, 1924) observed cases of mild pancreatitis in which the diagnosis of aortitis had been made owing to pain and abnormal pulsations in the epigastric region. The ache was generally diffuse or to the right or left of the median line, and was increased by pressure. It increased toward the end of gastric digestion, and there was a sensation of oppression. If acute painful phases occur, they may be mistaken for gall-stones or gastric ulcer attacks. The aorta pulsation is transmitted in an abnormal manner to the palpating hand, and can be distinguished over an area much broader than the aorta.

Eggers (Ann. of Surg., Aug., 1924) reports 6 cases of acute pancreatitis which contribute evidence to the theory that infection has no direct connection with acute pancreatitis, but that it results from the action of liberated pancreatic ferments on the surrounding tissue.

In reporting a case of hemorrhagic pancreatitis, Laignel-Lavastine and Potez (Bull. Soc. méd. des hôp. de Paris, Nov. 21, 1924) recall that the diagnosis is difficult in such cases, the severe pain in the abdomen resembling greatly that of gall-stone colic. In 2 cases observed by Prat (An. de la Fac. de Med., Montevideo, ix, 623, 1924), there were no signs of fat tissue necrosis. The sudden continuous, agonizing pain and rapid, thready pulse were the only appreciable symptoms in the robust young man till death occurred after 8 hours.

In his 2d case an operation at the 16th hour revealed the pancreas hard and triple its normal size, but no fat necrosis and no tumor, and the pulse was full and normal. The gall-bladder was drained, removing numerous concretions, with recovery of the man, aged 28. The only difference noted between the pain of perforation of the stomach and that of acute pancreatitis is that with the former the upper abdomen is hard and taut. In ileus the vomiting is more incessant.

As stated by Arnsperger (Deut. Zeit. f. Chir., Dec., 1924), the prognosis of acute pancreatitis is always grave but early surgical treatment, with proper technic, affords a hopeful outlook, particularly if a carefully chosen diet is employed.

# PARALYSIS AGITANS.—A

summary of the general knowledge on the subject indicates, according to Walshe (Brain, May, 1924), that abnormalities of the reflexes play an important rôle in the rigidity observed in paralysis agitans. To determine the nature of the phenomenon, he injected a 1 per cent. solution of procaine at the motor points of the muscles affected, as indicated by Erb's chart. For the biceps 18 to 25 c.c. and for each head of the triceps and each of the forearm muscles 8 to 12 c.c. gave the best results. The effect was an appreciable diminution of the spasms on passive manipulation after 5 minutes; the maximum effect was reached in from 15 to 25 minutes, some degree of hypotonia persisting 3 hours. The writer concludes that the rigidity of paralysis agitans is the result of some abnormality in the reflex arc, and that the tremor differs in its nature from that of the rigidity.

TREATMENT .- According to Dragotti (Policlin., Jan. 23, 1923), in the Parkinsonian symptoms which develop after epidemic encephalitis the usual measures employed for paralysis, including organotherapy, are futile. Temporary benefit is obtained, however, from scopolamine, atropine or eserine, and physical measures, such as static and high fre-Prolonged hot quency currents. baths also appear to have a sedative action, arresting the rigidity and tremor a few hours at times and promoting sleep.

PARALYSIS, GENERAL.— **DIAGNOSIS.**—According to Lévy-Valensi (Prog. méd., Apr. 19, 1924), one of the earliest effects of general paralysis in some cases is to stimulate the brain to extra fine work. business, audacious enterprises may be undertaken which are based on good reasoning and succeed, or a writer may turn out numerous valuable works. The brain seems to be speeded up for a short time. One physician who had never written much began to write important and valuable articles; he died from general paralysis by the end of the 2d year. Women sometimes display a passion for collecting gloves, stockings, or other articles that they cannot use.

Raynor (Arch. of Neurol. and Psych., Oct., 1924) warns that spontaneous remissions occur in untreated cases of general paralysis, though infrequently. In over ½ the cases they are not permanent. They may occur more than once in the course of the disease in the same person,

and are more common in cases presenting a gradual onset with changes in the disposition, emotional instability and defects in orientation and memory, than in other clinical types of general paralysis.

According to Klippel (Médecine, Feb., 1923), the reactions in the serum and cerebrospinal fluid are of but slight aid in the diagnosis of general paralysis. While the clinical symptoms are constant and characteristic, these qualities do not belong to the humoral reactions. He reports a typical case in which the Wassermann reaction, albumin content, number of cells, and response to the benzoin test in the spinal fluid were normal.

Referring to the value of the colloidal gold test in general paralysis, Sicard and Haguenau (Bull. Soc. méd. des hôp. de Paris, Nov. 14, 1924) contend that the favorable American and Austrian statistics in regard to successful treatment of this disease could be explained by their including certain cases of cerebral syphilis among those treated for general paralysis. They hold that cases suspected of general paralysis with a positive reaction of the cerebrospinal fluid in the colloidal gold test are incurable. However, recovery may occur with a negative response to their modified test. Dudgeon (Lancet, Sept. 20, 1924) used the Kahn test in 93 bloods from cases of general paralysis. It proved positive in 83 and doubtful in 1, while the Wassermann test was positive in 83 and doubtful in 5. He considers the Kahn test as confirmatory and an excellent routine test for institutions.

TREATMENT.—In a study of the results of treatment of 500 cases

of general paralysis by Furman (Arch. of Neurol. and Psych., Oct., 1924), emphasis is laid on the importance of diagnosing cerebrospinal syphilis, and on the fact that all suitable cases should receive an initial intensive course of the arsenic with spinal drainage and mercury and iodides as soon as practicable after If patients do not do admission. well on large doses, smaller doses should be used, neoarsphenamin being employed both for a certain amount of spirocheticidal effect and for a tonic action.

Of special interest in the treatment of paresis is the revival of a measure proposed in 1887 by Wagner-Jauregg and recently revamped by him (Jour. of Nerv. and Mental Dis., May, 1922), i.e., by inoculation with the malarial parasite. He had observed in the literature that cases of paresis had been more or less improved by intercurrent infectious diseases and suppurative processes, and deliberate infection of paretics suggested itself. Tuberculin, especially when given concomitantly with mercury, brought about sufficient improvement to restore patients to their normal life. Typhoid vaccine appeared even more effective. As a further step malarial infection was selected because it could be readily controlled, the tertian parasite being used. At the time of the report, over 200 cases had been treated, 1 paretic being inoculated from the blood of another. Typical malaria then developed with rigors, sweating, etc. After a series of 8 or 9 attacks the antimalarial treatment was instituted to arrest the infection.

Nonne (Rev. Méd. de Chile, Sept.-Oct., 1922), in a very carefully con-

ducted test in 74 cases, obtained 8 cures and 18 greatly improved. V. Askgaard (Ugeskr. f. Laeg., Apr. 10, 1924) obtained complete restoration of earning capacity in 32.4 per cent. of 37 cases and great improvement with partial restoration in 21.6 per cent.

Stärcke (Ned. Tijd. v. Gen., Apr. 19, 1924) holds that by inducing fever and then, during the febrile process, resorting to vigorous treatment with neoarsphenamin, the glia fibers are rendered permeable, thus allowing the drug, and possibly also the natural defensive forces, to reach the brain. Induction of fever by an intramuscular injection of boiled milk in the morning, massaging the region, or having the patient run for a few minutes, to promote absorption, is the 1st step. By evening the temperature rises to 38.5° or 40° C. (101.3° to 104° F.), and when it is at its height he injects from 0.6 to 0.9 Gm. of neoarsphenamin. This raises the temperature still higher, but if it exceeds 40° C. (104° F.), it is reduced with a cold pack. This treatment is repeated weekly, increasing the dose of milk to insure that the temperature goes to 39° C. (102.2° F.) at least. No signs of anaphylaxis ever appeared, and the improvement was fully equal to that realized with malaria treatment without entailing any danger.

In cases of paresis in which malarial treatment is contraindicated, as in the presence of heart lesions, or in cases not under close control and observation, B. Pfeifer (Münch. med. Woch., Jan. 30, 1925) recommends the use of Albert 102, an arsenobenzol preparation introduced in 1923 by Kalberlah and differing from arsphenamin in being unoxidizable and of lower tox-

icity. In the writer's 22 cases successive intravenous doses of 0.1, 0.2 and 0.3 Gm. were given, the last dose being then usually continued, though occasionally increased to 0.4 Gm. In the 12 cases in which the treatment could be completed an average total amount of 10.4 Gm. was given. Remissions resulted in 10 of the 12 cases. There was an average gain in weight of 91/2 pounds. Disturbance of articulation disappeared in 4 cases, and pupillary disorders and facial paresis, in 3 each. The blood Wassermann was improved in 6 cases and the spinal Wassermann in 4.

PARATHYROIDS.—The functions of the secretion of these small organs are generally deemed obscure, but 3 main rôles are credited to it: (1) As antitoxic, to oppose the accumulation of guanidin, a product of metabolism, in the blood, and thus prevent spasticity of the muscles; (2) as regulator of calcium metabolism, which also concerns muscular activity, and (3) as participant in maintaining the acid-base equilibrium of the body at large. Again, according to Vines (Brit. Med. Jour., Nov. 10, 1923), the rationale of parathyroid therapy is to reëstablish the normal endocrin balance between the sympathetic and parasympathetic when it has been disturbed by infection. As each of the investigators who inaugurated these theories defends his own more or less as the unique one, it would be idle to undertake a detailed analysis here. Their bearing upon parathyroid therapy will alone, therefore, be considered.

In a discussion of the present position of parathyroid therapy, MacD. Critchley (Pract., July, 1924) concludes that its field is very wide since it includes: (1) Instances of supposed parathyroid deficiency or partial

parathyroid privation. (2) Cases of increased nervous excitability, whether in the domain of the nerve-endings, the peripheral neurones, the spinal reflex arcs, or even the highest cortical processes. (3) Cases of true or supposed calcium deficiency. (4) Chronic toxemias. (5) Acute bacterial invasions. (6) Disease of other endocrin organs.

Berkeley (Boston Med. and Surg. Jour., Feb. 12, 1925) summarizes the disorders in which parathyroid is actually helpful, provided a pure preparation is used. These comprise all forms of tetany, which may occur -besides the form due to deficient activity or surgical removal of the parathyroids-in gastric dilatation, pregnancy and rickets. In post-natal conditions of infants he holds that larger doses than ½0 grain (0.0013 Gm.), the dose of an active preparation, should be tried orally or subcutaneously. It is also useful in chronic suppurative processes, particularly in varicose ulcers, as recommended by Vines. According to Berkeley, the leading indication for parathyroid is in paralysis agitans, in which, in his hands, the drug has been successful in 60 to 70 per cent. of the many cases he has treated. It must be said that such results have not been observed by other clinicians, owing, probably, to inertness, partial or complete, of the preparation used.

PELLAGRA.—G. D. Head (Arch. of Int. Med., July, 1924) observed an interesting case in a married woman of 50 years who presented the typical signs of pellagra though residing in South Dakota, a supposedly non-pellagrous territory. The patient had been deprived of meat for

about 2 years prior to the onset of the symptoms. Rapid recovery ensued on a generous meat diet and the concomitant use of sodium cacodylate intravenously. In the author's opinion, this supports the view that the disease is due to deficiency of proteins in the diet. Owensby (Med. Jour. and Rec., Oct. 15, 1924), however, had 28 recoveries in which the only treatment consisted in the addition to the daily diet of tomato juice, raw cabbage, lettuce, and the waters in which the vegetables had been cooked.

### PERICARDITIS.—DIAGNOSIS.

-R. S. Morris and C. F. Little (Amer. Jour. Med. Sci., Nov., 1923) note that the cardiohepatic angle in pericardial effusion is usually an acute angle. The area of relative cardiac dulness is pyriform and generally extends upward to the 1st interspace. Widening of the area of dulness and of the shadow in the 1st and 2d interspaces occurs relatively early and is best determined with the patient in the recumbent posture. Shifting dulness has proved to be the most reliable physical sign of fluid in the pericardium. In a case of pericarditis with effusion reported by Totani, Okada and Shima (Jour. of Oriental Med., Feb., 1923), the electrocardiograms indicate that rotation of the heart around its own axis occurred, accompanied by displacement.

The differential diagnosis of enlarged heart and pericarditis with effusion was studied roentgenologically by Perkins and Lattin (Amer. Jour. of Roentgenol., Aug., 1924) in 350 children at the Seaside Hospital, New York, specializing in the acute rheumatic heart. In children hearts of

great size are often encountered, the enlargement being diffuse and involving both the left and right sides. Such hearts indicate valvular disease, also an active or inactive rheumatic infection of the whole heart structure. i.e., the myocardium, pericardium, and the valvular endocardium. Acute rheumatic myocarditis leads to enlargement by causing loss of myocardial tone. Pericarditis may cause an enlarged X-ray silhouette in 2 ways: (1) By pericardial effusion, especially of medium or large size, and (2) by chronic adhesive pericarditis. Here the heart's action is impaired by the numerous adhesions which tend to bind the heart to the pericardial sac and often the latter to the chest wall, producing compensatory hypertrophy of the heart muscle. Hearts of this type reach the largest size of all. The X-ray findings of the greatest help are: A wide shadow enveloping the great vessels at the base of the heart; absence of pulsation of the left border of the cardiac silhouette; actual demonstration of the heart shadow within the pericardial shadow, and water-bottle shape of the heart shadow, changing shape characteristically with posture. The X-ray may occasionally help decide the point of election for paracentesis. Any aid as to when and where to puncture is of value.

According to A. Casaubon (Semana Méd., July 12, 1923), few diseases have so many symptoms as pericarditis with effusion, and yet the differential diagnosis is often masked by the preceding *pneumonia in infants*. In older children, the pericarditis is generally of rheumatic origin. In rheumatic cases, puncture is seldom

necessary, but otherwise it is almost indispensable.

Braun (So. African Med. Rec., Sept. 27, 1924) relates the case of a woman, aged 32, suffering from pericardial effusion with paralysis of the left recurrent laryngeal nerve.

TREATMENT .- R. L. Gilman and C. J. White (Jour. Amer. Med. Assoc., Sept. 1, 1923) studied the influence of an old empiric measure, the use of the ice-bag to the precordium, in 25 persons, all normal. They found that even in these normal subjects, there was a maximum fall of 10 beats in the heart rate at the end of 30 minutes. This bears out the empiric use of the icebag in such conditions as pericarditis, endocarditis, etc., but the writers conclude that the greatest effectiveness of the measure would be achieved by its use in alternating 1/2 hour periods.

R. H. Oppenheimer (Jour. Amer. Med. Assoc., May 24, 1924) resorted to therapeutic pneumopericardium in a case of pericarditis with effusion on the plea (1) that the aid after drainage would serve to keep apart the inflamed surfaces, thus preventing the formation of adhesions; (2) that relief would be obtained from the embarrassment of a voluminous exudate, while the air would temporarily maintain the pericardial distention and allow it gradually to contract as the air was absorbed; (3) that there would be delay in the reformation of the exudate, this being brought about by the tendency of the air to maintain the pressure that had been exerted by the fluid; (4) that in the case reported, the process being tuberculous, the air might have some effect in hastening the

termination of the inflammation, a phenomenon observed at times in tuberculous peritonitis. The 1st paracentesis was done on Dec. 31, 1923; Jan. 4, the 2d; Jan. 8, the 3d; Jan. 18, the 4th; Feb. 1, the 5th. Each injection of air was followed by marked subjective and objective improvement. The patient was discharged Feb. 2.

Considerable experience in pericardial surgery warranted J. B. Roberts (Arch. of Surg., Jan., 1923) in the opinion that while careful investigation should always be made by percussion, auscultation and Roentgenographic study before resorting to tapping, or other surgical attacks, various researches and many war experiences in thoracic wounds and the acknowledged innocuousness of pericardial incisions indicate that it may be at times not only wise, but imperative, to open the sac of the heart for diagnosis.

R. Brooke (Lancet, Aug. 16, 1924) performed pericardotomy with drainage of the pericardium in 36 cases of pericarditis secondary to osteomyelitis. Recovery after operation took place in only 2 instances. In both these cases the primary bone disease had been operated on at a comparatively early stage, and the pericardium was drained before the effusion had become purulent. It is a matter for serious consideration, from this experience, whether it is not advisable to perform early pericardotomy in cases of osteomyelitis before the effusion becomes purulent. The evidence seems positive in this respect.

### PERITONITIS. — DIAGNOSIS.

—Zierold (Ann. of Surg., Mar., 1924) discusses a series of 28 cases of "primary" peritonitis. In 10 cases in which no focal disorder or accompanying disease could be discerned elsewhere in the body, 5 patients had pain and vomiting at first. Of the 18 cases accompanied or preceded by

other sites of infection, only 4 noted pain as an abdominal symptom, and but 5 vomited. Hospital records showed an early rise of temperature with a rapidly developing septic curve. A low temperature occurred in the few adults who had no accompanying disease and who soon died. Leukocytosis was almost invariably present, the 1 exception being a leukopenia in influenza. In accord with Rabinowitz's observations, diarrhea was infrequent, viz., in but 3 instances. In 20 of the 28 cases there was abdominal distention as the chief terminal symptom, with relatively large amounts of fluid at the autopsy.

In regard to chronic subphrenic peritonitis, Chiari (Arch. f. klin. Chir., Feb. 10, 1923) states that the 1st symptom is a peritoneal friction sound. It sometimes lasts but a few hours or days and then disappears, and returns at the slightest "cold." The intervals sometimes reached months. The sound can be heard at the costal arch from the median line to the axillary line, and can be perceived with the hand laid flat on the wall.

TREATMENT.—B. von Lükö (Zent. f. Chir., May 5, 1923) had been using camphorated oil in peritonitis, reducing the mortality somewhat, but in several instances abscesses developed in Douglas's pouch. Subsequently he used ether instead, injecting, in cases of perforative peritonitis, from 80 to 100 Gm. (4 to 5 fluidounces) of ether into the abdominal cavity. In 200 cases no harmful effects were observed, and the mortality was reduced over ½, to 28 or 30 per cent. The effect of ether is often instantaneous. The

facial expression of the patient changes; the color improves and the pulse grows stronger. Of late he has been trying a mixture of camphor and ether, but he cannot state as yet whether this will effect a further reduction of the mortality.

Küstner (Deut. med. Woch., Dec. 21, 1923) states that ether takes up fats and fatty acids from the pus in peritonitis. After the ether has been allowed to evaporate, the peritoneum is found covered with the combination thus formed, which has an antiseptic action, and continues the disinfecting action of the ether. The hyperemia induced by the ether is also favorable. Consequently, he considers the use of ether in large amounts rational in the treatment of purulent peritonitis.

A fatal outcome from the injection of ether in diffuse peritonitis was observed by C. Weber (Zent. f. Chir., July 28, 1923), after he had used the injections with favorable results in about 100 cases. The fatality was in a young woman, aged 21, with appendiceal peritonitis. He has lost confidence in the absolute harmlessness of ether injections, and will proceed more cautiously in feeble individuals and children. He holds, nevertheless, that ether exerts often an astonishingly favorable effect in almost hopeless cases. He introduces ordinarily from 80 to 100 Gm. of ether.

Stegemann (Arch. f. klin. Chir., cxxiii, 523, 1923) observed 3 cases in which the accumulation of gases in the abdominal cavity was such as to threaten life. They had developed in the course of gangrene of the abdominal walls, but the pulse remained good. An incision such as that for enterostomy released an enormous

amount of odorless gas. The bowel seemed to be normal although compressed nearly flat.

As a result of careful experiments, Costain (Surg., Gyn. and Obst., Mar., 1923) holds that there occurs a fatal absorption of pathogenic substances through the thoracic duct in suppurative peritonitis. Such being the case, the occurrence of a fatal absorption through the subperitoneal capillaries or through the diaphragmatic lymphatics to the anterior mediastinal lymphatics and the right lymphatic duct is disproved. The experiments showed, moreover, that when a fatal absorption is overcome by lymphaticostomy, the peritoneal cavity is capable of looking after such a formidable structure as a necrotic appendix.

According to G. E. Armstrong (Surg., Gyn. and Obst., June, 1925), the treatment of peritonitis involving the pelvic and small intestine is extremely simple. The germs concerned can be destroyed only by the toxins that they themselves create; their death is assured, given sufficient time. The procedure advised in general peritonitis is merely to pass a small, soft rubber tube or an accordion drain nearly, but not quite, to the bottom of the pelvis (not using any gauze), place the patient in the Fowler position and give saline solution by rectum or intravenously if necessary, and withhold food until the bowels move. The tube is not for drainage, but to allow enough fluids to escape to relieve the intraabdominal tension and thus facilitate circulation through the blood and lymph vessels. The writer maintains that all patients with general peritonitis treated in this way will

recover if the treatment is instituted before paralytic obstruction is developed.

J. E. Loveland (Ibid., Mar., 1925) insists that in acute diffuse peritonitis in children both stomach drainage with an indwelling Rehfuss tube and an enterostomy are required. In the case he reports the stomach drainage had the following 4 advantageous effects: (1) It soothed the child by allowing it to drink all the cold fluids desired (3 quarts daily of orangeade, lemonade, water, ice cream, etc.), the fluids draining out through the Rehfuss tube as fast as swallowed; (2) it arrested the fecal vomiting, with its exhausting exertion; (3) it washed out the intestinal toxins from the stomach (about 3 quarts daily); (4) it combated the high fever by the cold fluids. If the tube is not well borne, even a gastrostomy should be considered. The high enterostomy is done both for drainage and for nourishment. Five per cent. glucose solution runs in gradually through this enterostomy from a funnel hung about 10 inches above the abdomen. In the author's case, 48 ounces of this solution were thus run in in 4 days, and had a striking effect in strengthening the child's pulse and apparently saving the child's life. Drainage from the enterostomy can be alternated with nourishment. Tranquility should be maintained by generous subcutaneous doses of codeine phosphate. Tolerance of the indwelling tube may be facilitated, if necessary, by having the patient, after the tube is in the stomach, swallow large quantities of cracked ice in a short time. Continuous hot packs, with the electric pad to avoid disturbance, should be used.

TUBERCULOUS PERITONI-TIS.—According to Gerhartz (Med. Klin., Feb. 17, 1924), injury of the peritoneum may act as primary cause of tuberculosis of the same owing to the resulting reduced resistance of the peritoneal tissues to infection. Pertussis

The symptoms of the disease may appear 6 months or longer after the traumatism.

TREATMENT. - Mattick (Amer. (Rev. of Tub., Jan., 1924), in reporting a case in which intraperitoneal oxygen inflation was used successfully, even though marked ascites was present, states that the method is easy and free of danger, and offers as good a prospect of ultimate cure as any of the other methods of treatment, including celiotomy, X-rays and heliotherapy. O. M. Gilbert (Ibid.) recommends pneumoperitoneum in preference to laparotomy, the artificial introduction of air being as effective as when it is admitted through an abdominal incision. In a personal case, 6 liters of yellowish fluid were 1st withdrawn from the abdomen, and 5 days later another 4 liters, followed by the introduction of 1500 c.c. sterile air by means of an artificial pneumothorax apparatus. At the end of a week, another liter was withdrawn, and 500 c.c. of air introduced. After the 1st inflation, the patient experienced considerable distress; but the temperature fell from 99.5 to 101.8° F. (37.5° to 38.7° C.) to normal in 2 weeks. After the 2d treatment, the gastric symptoms rapidly disappeared, and the patient, a physician, has steadily improved ever since, having taken up his practice again in 1921. The writer refers to similar results obtained by Stein and others. He employed the same treatment in a boy of 18 years, supplementing it with natural and artificial heliotherapy.

PERTUSSIS. — DIAGNOSIS. — E. Best (Arch. f. Kind., Dec. 24, 1924) states that while an early diagnosis may be obtained by cultivating pertussis bacilli in a glycerinpotato-agar medium, the procedure is unreliable with negative findings. Povitzky (Jour. of Inf. Dis., Jan., 1923) found that a definitely acid reaction in a suitable medium was favorable for the isolation and growth of B. pertussis. It is especially valuable because it inhibits the growth of B. influenzæ and other organisms found in the sputum of patients with pertussis. The most favorable point of acidity for isolation was pH 5. The limits of acidity favorable to the growth of B. pertussis are pH from 6.1 to 4.4.

As a useful aid in the early detection of whooping-cough H. Heiman (Arch. of Ped., June, 1924) lays stress on lymphocytosis, of which he made a study in a large series of To simplify the procedure, both the small and large lymphocytes and the transitionals are counted together as lymphocytes; the total leukocyte count is dispensed with. A blood smear is taken from each case and stained with Jenner's fluid. Out of 124 clinically positive cases, 65.5 per cent. showed a very definite relative lymphocytosis. Out of 84 suspicious cases which later proved to be pertussis, seen within the 1st 2 weeks of the infection, 82 per cent. showed a very definite lymphocytosis, while of 57 suspicious cases which later proved not to be pertussis, only 10 to 17 per cent. showed lymphocytosis. The writer deems isolation justifiable on the basis of a suspicious cough with lymphocytosis.

PROPHYLAXIS.—A. H. Meyer, M. Kristensen and E. Sörensen (Acta Paed., Oct. 25, 1924), in a comprehensive study of reports from hospitals, general practice, children's homes, etc., found the great majority indicated that vaccine given during or prior to incubation tends to prevent the disease, and that advantage resulted in many cases when the vaccine was given in the catarrhal stage or the 1st week of the paroxysmal stage. They recommend intramuscular injection and larger doses given more frequently.

According to Z. von Bokay (Jahrb. f. Kind., Aug., 1924), the Bordet-Gengou vaccine is effectual in prophylaxis provided the Bordet-Gengou bacillus is present in the initial cases. If this bacillus is absent, he uses an autogenous group vaccine obtained from cultures of the bacteria found in the respiratory tract of the 1st patients. The results appeared encouraging.

TREATMENT.—G. Guinea (Arch. Españ. de ped., Oct., 1924) employed intramuscular injection of ether into the buttocks in 302 children suffering from pertussis. Up to the age of 6 months, he injected 1 c.c. (16 minims) daily; above this age, 2, 3 or 5 c.c. (32, 48 or 80 minims) at a time on alternate days. The coughing spells became shorter and less severe, and there was no further vomiting after 1 or 2 injections. The disease was much shortened. Complete cure was obtained with 2 to 8 or 10 injections. Pneumonia developed after the ether was given in but 1 case. He reports 250 cured; 35 improved, and 17 unmodified.

W. F. Drake (Ohio State Med. Jour., May, 1924) likewise found that the intramuscular injection of ether gave very good results. The duration of the disease was reduced to an average of 3½ weeks; the par-

oxysms to 1/2 after the 1st injection, and the whoop disappeared usually before the end of 3 weeks. Vomiting ceased after 1 or 2 injections. Any serious complication present was aborted. In 25 cases treated by Panayotatou (Brit. Jour. of Child. Dis., July-Sept., 1923), 2 c.c. (32 minims) being injected every second day, the result was rapid recovery in from 12 to 15 days in all cases. Bedö (Zeit. f. Kind., June, 1923) had noted that pertussis was entirely cured in 2 children given a general anesthetic for an operation, and employed intramuscular injections of ether to a total of 5 c.c. (80 minims). He found it painful, but the symptoms of pertussis rapidly subsided. He now restricts the treatment to severe cases and to infants.

According to R. D. Leonard (Amer. Jour. of Roentgenol., Mar., 1924), Roentgenotherapy, endorsed by the staff of the Floating Hospital, is an excellent method for controlling the severe symptoms. In 400 treated cases, the average duration of the disease was 5.5 weeks; in 200 untreated cases, 8.7 weeks. Each child received 4 treatments unless immediate improvement followed the 2d or 3d treatment. The treatments were given on alternate days, anteriorly and then posteriorly.

The relative value of the more recent additions to our therapeutic resources is summarized by H. I. Bowditch, R. D. Leonard and L. W. Smith (Amer. Jour. Dis. of Child., Sept., 1924) as follows: In exposed cases, the use of pertussis vaccine may be considered as probably from 85 to 90 per cent. efficient in preventing the disease. In active cases, the use of the Roentgen ray, supple-

mented by diathermy and medication, is indicated, particularly in those cases complicated by bronchopneumonia.

Having tested the therapeutic use of vaccine in 65 cases and its prophylactic use in 17 cases, C. A. Aldrich (Amer. Jour. Dis. of Childr., Apr., 1925) concluded that patients treated with vaccine after the onset of symptoms had slightly milder attacks, which terminated earlier than as outlined in text-books. There was definite evidence that some cases prophylactic were prevented by treatment. The average duration of the disease was about 6 weeks, with definite and lasting improvement beginning less than 4 weeks from the onset. The vaccine treatment should be instituted as early in the disease as possible.

In the light of his experience in over 500 cases, J. Taillens (Rev. méd. de la Suisse rom., Jan., 1925) prefers the use of sedatives. He obtained no positive therapeutic results from vaccine therapy or epinephrin, while the intramuscular injection of ether proved painful and uncertain in its action.

J. A. Henske (Nebr. State Med. Jour., Jan., 1924) tried serobacterins in 85 cases of whooping-cough and deems them efficient. No harmful reaction or infection occurred; nor did they give rise to complications. The earlier the vaccines were administered the better were his results.

PES PLANUS.—In a summary of the newer views concerning flat foot, Peltesohn (Med. Klin., Apr. 6, 1924) concludes that defective shape of the shoes worn and improper walking are its main causes. He and also

K. W. Fischer (Med. Klin., Oct. 26, 1924) refer to the habit of not walking with the feet placed on a straight line, the posterior part of the sole touching the pavement first. If these conclusions were true, however, practically everyone should be flatfooted. An important fact, also, is that localized or general myasthenia plays an important rôle in the morbid process in many cases.

E. Moser's method of treating spastic flat-foot is approved by Engelmann (Wien. klin. Woch., May 29, 1924) after using it in 24 severe cases. It consists in injecting 10 c.c. (2½ drams) of a 0.5 per cent. solution of procaine into the peroneus muscle, and the same quantity into the extensors.

PHENOLPHTHALEIN. -This agent, used extensively as a cathartic, occasionally causes an eruption. According to Hailey (Jour. Med. Assoc. of Ga., May, 1924), all cases so far reported have occurred in the Jewish race. Netherton (Med. Jour. and Rec., June 4, 1924) observed such a case in a girl of 18 years, who had been taking regularly a preparation known as "ex-lax." Numerous slightly grouped macular patches were scattered over the trunk, most numerous on the lateral surfaces. They varied from 1/2 inch to several inches in diameter; their color varied from purple to bright red, the larger plaques being somewhat raised. These began to fade after a dose of calomel, but returned with the administration of 1 grain (0.065 Gm.) of phenolphthalein.

PHLEBITIS.—According to W. F. Shallenberger (Surg., Gyn. and Obst., Sept., 1924), intravenous injections of gentian violet promise to be of great assistance in combating and aborting phlebitis. In 3 out of 5 cases the symptoms rapidly subsided after 2 injections of 30 c.c. (1 fluidounce) of a 1 per cent. solution of

gentian violet, administered 2 days apart, and in the other 2, favorable results were also obtained. In these 2 a 0.5 per cent. solution was substituted, the author having found the stronger solution apt to cause thrombosis at and above the point of injection. In preparing the solution the gentian violet is simply dissolved in sterile freshly distilled water and the solution filtered. Sterilization of the solution is not required. No considerable reactions from the injections were observed. The maximum dose of the dye is 5 mgm. per kilo. of body weight.

PINEAL BODY.—The prevailing opinion concerning this organ is that, as stated by Krabbe (Endocrinol., May, 1923), very little is known of its function, and nothing whatever of its influence on the body at large. He holds, however, that precocious puberty coincides with teratoma formation in the pineal body. Assuming that the organ is the source of a secretion, Izawa (Jour. Okayama Med. Soc., Mar., 1924) fed guinea-pigs with pineal body, but the animals differed in no way from the controls, except that the development of the growth of the testes and ovaries was slightly In dogs, similar experidelayed. ments by Biedl some years ago produced like effects, thus suggesting that the rôle of the pineal is an inhibitory one, the purpose of which is to prevent overdevelopment of the genital organs during their formation, i.e., up to about the 7th year, when it begins to recede functionally by undergoing fibrous degeneration. Recent histologic researches and experiments by Giuseppe (Endocrin e patol. Cost., Jan., 1923) tend to show, however, that it is a permanent organ.

In a case of *pineal tumor* described by de Monchy (Brain, July, 1923), the symptoms were those observed in dystrophia adiposogenitalis. Rhythmic convergence spasm of both eyes was also present. At the autopsy a tumor consisting of 2 parts connected by means of connective tissue was found, 1 partly lying in the situation of the pineal, the other between the folds of the dura mater and the falx cerebri and the tentorium cerebelli.

Berkeley (Amer. Med., Nov., 1924) relates 2 cases in which considerable benefit was obtained from pineal gland-dosage not given-1 from his own practice—an idiot 7 years old who had never spoken and who in 7 weeks was able to use between 50 and 100 words. The 2d case. from the literature, was that of a helpless, inert child of 19 months who, after small doses of pineal for 3 months, was "able to stand upright, reach for objects," etc. Nothing proves in the histories of these cases that the pineal was the seat of deficiency, or that the effects produced in both cases were not purely pharmacologic. That it acted merely as a drug is suggested by the fact that Berkeley found pineal gland "a valuable stimulant for old people."

PITUITARY BODY.— In 1903 Sajous pointed out that the pituitary was not a gland, as generally believed. He held, on the basis of much evidence, that it was the starting-point of a nervous mechanism whose nerve elements were connected with nuclei in the tuber cinereum of the hypothalamus. These, in turn, he held, acting as coördinating centers, sent nerve-paths via the

medulla oblongata to all other endocrin organs and to the cardiovascular system at large, as far as their sympathetic nerve supply was concerned. The labors of Roussy and Camus and many other investigators have since strongly sustained this interpretation by showing that even slight traumatisms in the tuber cinereum could produce phenomena credited by investigators other than Sajous to a secretion. Sjövall (Acta med. Scand., Oct. 4, 1923) recently contributed additional evidence to the strength of this view. Emphasizing the extreme importance of the floor of the 4th ventricle, with which the pituitary is connected by the infundibulum, he urges that it contains a complicated regulating mechanism for the whole body. He adduces the case of a hydrocephalic woman of 20 years who at autopsy was found to have a pituitary, especially the anterior lobe, tightly compressed by the sella turcica, and whose tuber cinereum was thin, though the seat of infiltration, the whole body being strikingly adipose.

The tendency at the present time, however, is to concentrate the functions wrongly attributed to a "secretion" or "secretions" to the nuclei of the tuber cinereum or midbrain. That the pituitary itself takes part in those functions is shown by the experiments of Ascher (Med. Klin., Nov. 30, 1924) in pups. Removal of the pituitary caused complete arrest of growth and mental development, and persistence of the juvenile fat, lanugo and sexual infantilism. adult animals removal of the pituitary alone caused abortion in pregnant animals.

The influence of the pituitary upon

the cardiovascular system at large, pointed out by Sajous over 2 decades ago, is further sustained by the observation of J. Perkins (Boston Med. and Surg. Jour., Nov. 20, 1924), who states, regarding several cases of manifest hypothyroidism treated by him, that "the things I wish especially to bring out are the relation of spontaneous hemorrhagic spots in the skin, easy bruising, dilated vessels on the thighs, the inability to become pregnant and the proneness to miscarriage to insufficiency of the anterior pituitary gland." In 1 of these cases, on being given "anterior pituitary and later in addition to this mixed gland," the dilated vessels on the thighs disappeared, gradually the skin became normal, and the irregularity of the fat practically disappeared. He employed anterior pituitary alone in dysmenorrhea. That the influence of the anterior pituitary administered was pharmacologic is indicated by its composition, lecithin, its most active agent, being a vasoconstrictor.

The use of X-rays has been advocated by various observers. Roussy, Lévy, Bollack and Laborde (Paris méd., Sept. 16, 1924) urged, on the basis of 7 cases, that it was useless in tumors of cortical origin, but that it was very efficient in tumors of infundibulo-hypophyseal origin and in intra- and extra-sellar growths. Foix, Hillemand and Schiff-Wertheimer (Paris méd., Dec. 13, 1924) also obtained excellent results in an infundibulo-hypophyseal tumor with marked visual disorders and the adiposogenital syndrome.

E. Kugler (Wien. klin. Woch., Nov. 13, 1924) observed in several patients with pituitary syndromes an impossibility to concentrate the mind, *i.e.*, dyslexia, and obtained beneficial effects from injections of **pituitrin**.

PLACENTA .- MANUAL EX-TRACTION .- To reduce the risk of infection in this procedure, R. Joachimovits (Wien. klin. Woch., May 8, 1924), after washing his hands, moistens them with 1:4000 or 1:5000 adrenalin chloride solution, prepared by pouring the contents of 1 or 2 1-c.c. ampoules of 1:1000 adrenalin into 4 or 8 c.c. of sterile water. The solution is directly poured on the hands or applied with a small cotton pledget. When the hand enters the uterine cavity immediate contraction of the vessels with which it comes in contact results. Besides arresting hemorrhage, the vasoconstriction notably reduces the risk of penetration of pathogenic germs. In 3 cases in which this procedure was employed, there was no subsequent rise of temperature, although in 1 instance cleansing of the hand had been rather hasty.

PLACENTA PREVIA.—The relative mortality in various forms of treatment was studied by Mikulicz-Radecki (Arch. f. Gyn., Dec. 15, 1924). He found placenta previa in 1.74 per cent. of 9608 parturients; 16 per cent. were in primiparas. In about 50 per cent. the 1st hemorrhage took place less than 10 days before term. In the 31 cases with delivery by Cesarean section, the mortality was 3.3 per cent.; in the others, 11.5 per cent. The fetal mortality was 70.1 per cent. in the latter group. With Cesarean section, 83.4 per cent. of all viable infants were saved.

In an analysis of 314 cases of placenta previa out of 10,462 deliveries by Calderon and Villarama (Philip. Isl. Med. Assoc. Jour., July, 1924), there was found 1 case of placenta previa for every 34 deliveries. The maternal death rate was 16.56 per cent.; the infantile, 67.18 per cent. Fourteen infants (4.45 per cent.) died unde-Thirty-eight babies died after delivery. The greater number of mothers (59.61 per cent.) died from acute anemia. Fourteen were admitted in a dying condition, who were not given any treatment at all. Maternal death after Cesarean section is due to profound anemia before the operation. In no case was post-operative peritonitis found to be a cause of death. G. Conrad (Zent. f. Gyn., Jan. 31, 1925) presents statistics on 203 cases (0.97 per cent. of about 21,000 births from 1906 to 1924), 20.2 per cent. of which were primiparas; 16.7 per cent. secundiparas, and 21.6 per cent. tertiparas. Of the infants, 54 per cent. died, and of the mothers, 8.8 per cent. In the 51 Cesarean sections, 5 mothers and 5 infants died; in the 3 transperitoneal cervical Cesarean sections, no deaths occurred. He urges that Cesarean section is the best treatment in placenta previa for both mother and infant, and emphasizes the importance of sending every placenta previa patient to the hospital at once, before grave loss of blood, without infection, and with the fetus still living.

W. Liebe's (Monats. f. Geb. u. Gyn., Feb., 1924) mortality in placenta previa cases since 1919 has been 1.73 per cent. of the 52 women, and 20.37 per cent. of the children. The birth proceeded spontaneously in 5 cases, and with the inflatable bag in 1 case. Braxton-Hicks version was done in 8 cases and Cesarean section in 38. In his last 591 cases of placenta previa, McPherson (Amer. Jour. of Obst. and Gyn., Apr., 1924) lost 70 mothers, a mortality of 12.1 per cent., with a still-birth mortality of about 42 per cent. The preference in treatment was given to gauze packing, followed in most instances by an internal podalic version, this being done in 354 cases. There were 34 abdominal Cesarean sections, 2 extraperitoneal sections, 3 vaginal hysterotomies, 20 Braxton-Hicks operations, 43 breech extractions and 22 craniotomies on dead children, the rest being made up of forceps and normal deliveries.

In severe hemorrhage due to placenta previa, P. Trillat (Bull. Soc. d'obst. et de gyn., xiii, 456, 1924) resorts to immediate artificial delivery to prevent further hemorrhage and enable the attendant to ascertain the condition of the uterus. As a preliminary to this procedure, he gives massive injections of saline solution subcutaneously or intravenously;

these are repeated after the delivery if required. Tears of the soft parts are sutured, even if they extend to the lower uterine segment. Oxygen, 15 to 20 liters, is given to the child every 2 hours for 4 or 5 days to prevent bronchopneumonia.

PLAGUE. - PNEUMONIC. -Nicolle and Gobert (Arch. de l'Inst. Pasteur de Tunis, June, 1924) consider pneumonic and bubonic plague to be different diseases. bubonic plague is transmitted from the rat to man, and rarely from man to man, pneumonic plague has no connection with rats, and is extremely contagious from man to man, entails no buboes, affects the lungs from the start, and is almost always fatal. In Africa it has occurred in small epidemics ever since the influenza epidemic of 1918, and was not confined to ports. The authors suggest that pneumonic plague is due to an association between the influenza virus and the plague bacillus.

Tsurumi, Hara, Ima, Awok and Sakamoto (Japan Med. World, July, 1923) found the lungs to be the seat of hemorrhagic seroexudative pneumonia in 9 autopsies, and a cellular exudation in 4 others. The period of survival was less than 80 hours in The same the cases examined. authors (Ibid., Aug., 1923) urge that the material from a plague victim for examination should always be obtained from the lungs, since these alone invariably contain the bacillia point of major import in the prevention of epidemics.

BUBONIC.—In the Porto Rico epidemic of 1921, according to Ortiz (Porto Rico Med. Assoc. Bull., Mar., 1923), the symptomatology of acute

parenchymatous nephritis was the first to appear, soon followed by intense prostration, high fever, the appearance of an intensely painful bubo or buboes, high polymorphonucleosis, and retention of chlorides. Otero states that the epidemic of plague in Porto Rico was preceded by the finding of numerous dead rats in the streets. More than 78,300 rats were examined. The plague bacillus was found in 93. The rats came from 10 different localities, but San Juan was the main focus.

According to Zabolotny (Ann. de l'Inst. Pasteur, June, 1923), the Institute of Experimental Medicine at Petrograd had been investigating 81 endemic foci in southeastern Russia during the preceding 3 years, and had found that infection of the skin transmits the bubonic form of plague, while droplet infection is responsible for the pneumonic. The plague bacillus survives for 6 months in winter in human cadavers and animal carcasses. In summer it survives but 1 month, on account of the putrefaction. Wild rodents are the reservoirs of infection, but camels become infected and can also start an epidemic in human beings.

PROPHYLAXIS.—A study of bubonic plague in Bagdad by Heggs (Jour. of Trop. Med. and Hyg., Nov. 1, 1923) showed that in the interepidemic periods plague infected rats are always to be found, and that climatic conditions initiate and arrest epidemics. The effect of antiplague vaccine (Pasteur) is definite and almost complete and in some instances it lasts more than 1 year.

According to Otten (Netherl. Ind. Civil Med. Serv. Rep., pp. 115-248, 1924), chief of the plague preventive

riague.

service in Java, preventive vaccination with the Haffkine vaccine in a 12 years' test proved disappointing, the mortality being scarcely reduced 50 per cent. and the actual morbidity much less. The total of cases of plague in Java during the last 12 years reached 81,599, including 2000 of pneumonic plague. The 12 years' effort in evacuating houses, fumigation and disinfection only served to prove the futility of such measures. It was demonstrated, however, that rat-proof houses and rat extermination were the only certain remedies. The transmission is by commercial traffic, ship and rail in particular. The disease is also spread by market traffic; the foodstuffs bought at market may have been stored for months and during this time have served as food and nesting places for the house rat. When purchased and carried home, they contain infected fleas from these rats and transmit the plague.

Cherefeddin (Deut. med. Woch., June 20, 1924) injected 20 to 40 c.c. of antiplague serum into his assistant who had cut himself twice in the hand when making the post-mortem and in all persons who had been in close contact with a case of pneumonic plague not diagnosed before death. No infection occurred.

Gupta (Indian Med. Rec., June, 1923), during a recent plague epidemic, inoculated 503 persons with plague vaccine. Out of these, 9 persons were attacked with plague and 7 recovered. The 2 deaths were in persons who had received the preventive inoculations too late.

TREATMENT.—According to Lavandero (Bull. Porto Rico Med. Assoc., Mar., 1923), on the basis of experience gained in the Porto Rico epidemic, the amount of antitoxin required for a moderately severe case is greater than indicated in text-books; from 250 to 500 Gm. should be injected at 6, 8, or 12 hour intervals at first.

Ilvento (Policlin., Oct. 22, 1923) injects a 0.5 per cent. solution of iodine into the glands affected by bubonic plague, giving 4 injections of 0.5 c.c. (8 minims) daily. The injections cause edema around the glands. If the latter suppurate he injects a solution of iodine in alcohol or glycerin. All of his 17 patients recovered.

### PLEURISY.-TREATMENT.-

Blum's advocacy of calcium chloride is strongly endorsed by Krummenacher (Annales de méd., Mar., 1923). It hastens absorption of the effusion and reduces the temperature promptly, while promoting diuresis. In acute pleurisy, it sometimes restored conditions to clinically normal in 24 hours. The 10 cases treated showed that it had to be given in large doses: 15 Gm. (4 drams) of the dry calcium chloride in 24 hours, repeated the 2d day if the fever persisted, and reduced by 1/2 if the fever subsided. It should not be kept up for more than 5 or 6 days, otherwise the general condition suffers, the mineral balance becoming disturbed. It is rendered palatable by giving 2 spoonfuls of the concentrated (30 per cent.) solution in coffee, and drinking a little more coffee afterward. The effect does not seem to be improved by giving it intravenously.

Burnand (Bull. Soc. méd. des hôp. de Paris, Dec. 21, 1923) also gave large doses, vis., 3 to 8 Gm. (3/4 to 2 drams) of calcium chloride daily,

and noted a striking coincidence between the beginning of its use and the disappearance of fever. It acted as a diuretic, but its influence on the effusion was hardly perceptible. In other cases, however, defervescence began just as well without treatment.

Vallet and Augé (Bull. de l'Acad. de méd., July 29, 1924) treated 12 cases of acute postinfluenzal plcurisy, in all of which, except 1, streptococci were isolated. There were 4 deaths in a first group of 6 cases treated by ordinary medications with or without empyema operation, but an equal number of patients treated with autogenous vaccine all recovered. In 3 the empyema operation was performed after general symptoms had become attenuated and the pulmonary lesions had died out, but the other 3 patients were only treated by thoracentesis, repeated as frequently as necessary.

In the treatment of pleural exudates, Lunde (Zeit. f. Tuberk., Dec., 1923) resorts to salt reduction in the food, and gives daily 4 teaspoonfuls of the following solution: Calcium chloride, 30 Gm. (1 ounce); potassium acetate, 60 Gm. (2 ounces), and water, 285 Gm. (9½ ounces).

According to T. Pretolani (Morgagni, Jan. 27, 1924), authors disagree concerning the value of autoserotherapy, i.e., reinjection of part of the fluid removed from the chest during exudative pleurisy, but he observed a case which left no room for doubt. The 1st reinjection of serum brought no improvement, the chest being again filled with fluid 3 days after the thoracentesis, while the temperature rose to 39.7° C. (103.4° F.). After a 2d thoracentesis, the author reinjected in the gluteal muscles about 20 c.c. of the fluid withdrawn.

The temperature dropped the next day to 37.2° C. (98.9° F.), the chest dulness disappeared completely and the vesicular murmur was restored. From that day the condition of the patient improved steadily.

The X-ray treatment of chronic pleurisy without effusion is highly recommended by Bársony and Holló (Zeit. f. Tuberk., June, 1924). The pain is relieved after the 1st exposure, but 2 or 3 in addition are required to prevent a relapse. In 2 cases the irradiation was applied to the painful region at a focal distance of 30 cm., with 3 mm. of aluminum filter. The dose was  $\frac{4}{5}$  skin dose, once a week, repeated 3 or 4 times. The result was "surprising." With a complicating pulmonary lesion, irradiation should not be used.

H. Deist (Deut. med. Woch., May 9, 1924) observed an increase of chloride elimination during absorption of pleural effusions. He advocates a salt-free diet.

PNEUMONIA, LOBAR.—DIA-GNOSIS.—The puzzling diagnostic problems of pneumonia have been carefully analyzed by D. Riesman (Jour. Amer. Med. Assoc., Apr. 19, 1924). As he states, the disease is often overlooked when it does not present classical symptoms and Especially is this true of postoperative pneumonias which may be unaccompanied by cough, chest pain, or marked increase in temperature and respiratory rate. The pulmonary lesion is seldom anterior. It is important, therefore, to examine the posterior thorax carefully. spontaneous tuberculous pneumonia, the resemblance to lobar pneumonia is so close at times, at first at least, correct diagnosis is almost impossible. But: (1) Acute cases of tuberculous pneumonia nearly always affect the upper lobe; (2) painstaking examination will show some slight aberration in the physical signs; (3) the patient often has had a period of ill health prior to the acute onset; (4) leukocytosis is usually absent.

Puzzling also are those cases in which there are clinical symptoms but no physical signs in the chest. Central pneumonia is very likely present and very careful examination may reveal certain signs that will confirm the suspicion. There is a change in the percussion note over a small patch, usually inside or just below the angle of the scapula or high up in the Another evidence is suppression or muffling of the breath sounds over this area. On coughing, a few fine râles will appear at the end of inspiration. In children the throat should always be examined, as tonsillitis may have a very acute and stormy onset, not unlike that of pneumonia.

Pneumonia and pleurisy with effusion are often confounded. Mistakes will be avoided by remembering that: (1) The tactile fremitus in effusion is diminished or absent. (2) When the hands are moved up and down the sides of the chest, if an effusion is present the interspaces on the affected side are flush with the ribs, so that the latter are less plainly felt. (3) The percussion note is flat rather than merely dull, and the resistance to the experienced percussor is greatly increased. The dullness may be movable with change of posture. Grocco's triangle is also helpful. (4) There are no râles, as a rule, over the effusion; breathing is

usually dry and the cough sounds distant. (5) The voice sounds have a high pitch, a bleating, twanging quality called egophony. (6) The apex beat is usually displaced in the opposite direction. (7) Exploratory tapping or Roentgen ray examination may be necessary to settle the diagnosis.

That pneumonia may simulate typhoid or paratyphoid is well known. Hence the necessity for thorough laboratory and clinical study of patients presenting symptoms of any 1 of these conditions. Similarly, in every case of acute abdominal trouble it is well to make a thorough examination of the chest, with the thought in mind that the case might be one of pneumonia or, more rarely, one of pleurisy. The occurrence of meningeal symptoms may obscure a pneumonia, or, when that is known to exist, may raise the question of the presence or absence of meningitis. A lumbar puncture may be required for final judgment. Pneumonia in the aged is often difficult to recognize because it is not frank in onset or clearly defined in Rectal temperature gives a better clue to the extent of the fever in these cases. A curious confusion may arise during the course of acute pericarditis. With the development of an effusion of considerable size one can often detect, over the left lung posteriorly, percussive and auscultatory signs of pneumonic consolidation. The condition might be properly called "pericarditic pseudopneumonia." The anomalous signs are due to compression of the lung by the effusion.

The author recognizes a lobar form of bronchopneumonia, seen especially in children and young adults, and giving rise to a low, protracted fever.

The symptoms are slight—a little cough, a subfebrile temperature, scanty expectoration, and prostration somewhat disproportionate to the symptoms. The physical signs are, in a sense, much more striking than one would expect from the symptoms. They consist of a shower of crackling râles on inspiration, more abundant and louder, as a rule, after coughing. Lobar pneumonia is more common in infants and children than has been taught. The physical signs of primary lobar pneumonia are at times later in appearing and may be apical or basal. An expiratory grunt is very suggestive.

According to Wallgren (Acta Ped., Oct. 15, 1923), most cases of pneumonia in infants show shifting of the heart and mediastinum to the diseased side. This is regarded by him as important in diagnosis, to exclude pleural effusion.

The early diagnosis of pneumonia is facilitated, according to T. Howard (N. Y. State Jour. of Med., Apr. 18, 1924), by the following: (1) Early increased respiratory rate; (2) early leukocytosis; (3) areas of hyperresonance or impaired resonance, with diminished or roughened breathing; (4) presence of localized râles, best brought out by having the patient cough.

According to C. L. Greene (Minn. Med., Sept., 1923), 2 important types of lobar pneumonia with relation to symptoms should be recognized: (1) The sthenic; (2) the asthenic (senile, complicating, or terminal). From the standpoint of physical signs, 3 varieties are considered: (1) The common form, of frank development; (2) the so-called massive pneumonia, with blocking of the larger bronchi;

(3) the form characterized by gradual development from the hila to the periphery, i.e., central pneumonia. Typically, acute lobar pneumonia is initiated by a chill of varying duration, but in 40 per cent, of the cases studied it was lacking. Less freprodromal symptoms quent coryza, bronchitis, sore throat and muscle pains. Pain in the chest occurred in 90 per cent. of the sthenic type, often preceding chill and fever, and often referred to the abdomen, neck and arms. Sudden disappearance of pain may mean pleural effusion. Fever appears early, immediately after the chill, reaching 103 to 105° F. (39.4° to 40.5° C.), with accompanying symptoms, of which headache is the most common. Fever is usually continuous, but may be remittent and, in the asthenic type, absent. Abrupt rise may mean involvement of another lobe, complication, or beginning crisis. Abrupt fall characterizes actual onset of the crisis, if accompanied by obvious improvement in the general condition; otherwise it is ominous. The acute febrile period varies from 24 hours to 2 weeks or more. The crisis begins usually between the 5th and 8th days. When it is postponed for 12 days or more, lysis usually occurs. Dyspnea means, in most cases, extreme cardiac weakness or pleural effusion. The pulse is small, hard and rapid at first, becoming full and bounding as the fever rises. A pulserate of 130 or above is grave. The blood-pressure may be normal, but a sudden drop is ominous. If the sputum is frankly bloody, tuberculous pneumonia may be suspected, while a prune-juice color may indicate pulmonary edema.

Mouriquand (Arch. de méd. des enf., Aug., 1924) points out that the X-rays show in pneumonia in children a distinct triangle with its base directed towards the periphery and its apex toward the hilum of the lung. The triangle appears either early, after several days, or late, and disappears from 1 to several weeks after the crisis. It begins in the periphery, resembles an infarct, and is a sign of pneumonia with hepatization. Paisseau and Iser-Solomon (Ann. de méd., Jan., 1924) have found that very often the X-ray does not assist in diagnosis unless the clinical signs are considered. It is useful for detecting a complicating pleurisy or an abscess. They confirm Weill's and Mouriquand's observations on the bad prognostic significance of an early appearing and widely and rapidly spreading shadow.

TREATMENT. - In the acute pneumococcus pneumonias, according to S. Solis-Cohen (Ann. of Clin. Med., Sept., 1923), the chief aim should be to prevent circulatory failure, if possible by elimination or neutralization or destruction of the pneumococcus and of bacterial and tissue poisons; if not, by antagonization of their action and by counteraction of their untoward effects. Against the toxics, 3 methods of defense are available: 2 specific and 1 special though not specific. Of the specific methods, the 1st is that of active immunization—bacterination; the 2d that of passive immunization—the use of such antibody preparations as immune serums and Huntoon's antibody solution. The published results of these modes of treatment promise increasingly favorable reports for the future. The special method of chemotherapy which the author calls the "definite plan" makes use of quinine dihydrobromide; this is an agent of passive immunization since it destroys pneumococci and neutralizes the pneumonia poisons. Its use is guided by the temperature and its effect thereon, but it is not used as an antipyretic. The Gibson phenomenon is the definite guide for the use of pituitrin and other pressor agents. Pituitrin is preferred to adrenalin, as its effects last longer. It is injected as long as the systolic blood-pressure remains below the pulse frequency and until there is a safe interval between them. Caffeine is used rather than cocaine, as the pressor effect and diuretic action are greater and longer. When the diastolic blood-pressure and the respiration frequency approach within 10 points of each other, digitalis is to be given in full doses, using the best preparation available.

In the opinion of Harlow Brooks (Northw. Med., Jan., 1923), there is 1 drug which should preferably be given before it is needed, viz., digitalis, given before the heart muscle is either in a state of inflammation or degenerated. In the pneumonias of infants and children, he employs the drug infrequently, but as age increases, he uses it with increasing frequency and dosage. As a rule, he starts in adults with full dosage, 15 or 20 minims (0.9 to 1.25 c.c.) of the tincture every 2 or 3 hours, for the first 24 hours, and follows with a rapid reduction unless the case demands otherwise. In cases of known cardiac defect, he often digitalizes by the rapid method, 30 or 40 minims (1.8 to 2.4 c.c.) being given 3 or 4 times daily until digitalis effects are

produced. When the muscle irritability appears to be impaired, he may use strychnine with the digitalis. Caffeine is his drug of 2d choice in instances of circulatory failure in pneumonia. It should not be used in cases of active delirium nor in those instances in which sleep appears to be very necessary. Camphor is also a very useful drug, preferably, of course, given intramuscularly or subcutaneously. Adrenalin is used in cases with marked hypotension that appear to be going into shock or collapse. When cough is particularly annoying or exhausting, it should be controlled, if possible, by codeine, heroine or morphine in the order named.

Similarly, according to Jagic (Wien. klin. Woch., Jan., 1925), pneumonia requires energetic cardiovascular It takes time for the treatment. action of digitalis to develop, and it is too late to administer it when there are already signs of a failing heart. He therefore gives daily doses, corresponding to 0.2 or 0.3 Gm. (3 to 5 grains) of standardized leaf. They do no harm even if continued for 8 to 12 days or longer. Strychnine is a good vasotonic. Large doses of camphor should also be given daily. Caffeine may be added in grave cases.

W. A. Shepherd (Va. Med. Mthly, Sept., 1924) records 5 cases in which from 11 to 26 drams (44 to 104 c.c.) of tincture of digitalis were administered in the course of from 3 to 7 days with excellent results.

According to C. Lundsgaard (Ugeskr. f. Laeg., July 10, 1924), the anorexia of pneumonia patients exceeds that of persons with a heart defect by 1/3, and also that of persons in the rarefied air of high altitudes. The oxygen content of the arterial blood, as determined in 50 patients with croupous

pneumonia and 14 with influenzal pneumonia, was comparable with the oxygen content in a number of normal persons at an altitude of about 12,000 feet. The condition in both groups is very similar. Pneumonia patients thus have to combat the infection under conditions which greatly reduce their resisting power.

W. Broadbent (Lancet, Jan. 5, 1924) states that a vaccine, if of the right type of pneumococcus and the correct combination of germs, may be very useful if given early in the disease, but that it is not safe in the very toxic cases with low temperature, as the negative phase may be too much for the patient. Acetylsalicylic acid is valuable, but the doses should not be large. A case is cited in which just after the crisis, with normal temperature, intense dyspnea supervened, due to acidosis. Sodium bicarbonate by mouth and rectum stopped the dyspnea in a few hours and the child made a normal recovery. Quinine is also helpful, especially in postinfluenzal cases. The writer had good results with creosote. Ipecac and potassium iodide may be useful in loosening expectoration. Oxygen should always be kept ready. As a sedative at night, Dover's powder is one of the best agents. In cases of intense poisoning, Warburg's tincture is very valuable, given by mouth or rectum; besides being a bactericide, it is a strong stimulant. It must be given in alcoholic solution, since water precipitates the resins and destroys its efficacy. Hyperpyrexia should be treated by ice sponging or packing, and by large doses of Warburg's tincture. If the pulse rate is above 100, digitalis should be given regularly, but not in very large doses, and if it is up to 120, hypodermic injections of strophanthin should be given. Camphor hypodermically is also very effective.

Having observed the effect of subcutaneous or intramuscular injections of sodium nucleinate in stimulating leukocytosis in influenza as well as in normal subjects, F. M. Gardner-Medwin (Brit. Med. Jour., July 12, 1924) employed this agent in lobar pneumonia. The preparation used for intramuscular injection comes in ampules of 2 c.c., 1 c.c. containing 0.05 Gm. (3/4 grain) of sodium nucleinate. In every case of definite lobar pneumonia in general practice so treated, a crisis occurred 48 hours or so after the 1st dose, regardless of the day of administration. Of 53 cases, all responded to treatment except 8. Three patients relapsed, sustaining a fresh invasion of lung area, but in each case the temperature fell again by lysis within 48 hours after a further injection of nuclein. The author concluded: (1) That pneumonia is the result of lowered resistance. (2) That lowered resistance is coincident with, if not caused by, leukopenia. (3) That leukopenia is the result of a toxin which temporarily paralyzes the power of the system to respond to the chemotactic call of bacterial invasion. (4) That sodium nucleinate, injected intramuscularly, has the power to overcome this disability and call out the reserves of leukocytes stored in the marrow, converting the leukopenia into a leukocytosis, thereby precipitating the devolution of the disease. He observed that the action of this remedy was greatly facilitated by intensive alkalinization of the system with large doses of sodium bicarbonate.

H. E. Stewart (R. I. Med. Jour., Oct., 1923) advocates the treatment of pneumonia by diathermy. This method was 1st suggested by Sprague, Price and DeKraft, and was tried in the U.S. Marine Hospital No. 21, New York, in 1922. Since that time a fairly large group of patients has been treated. The apparatus employed must be one which will deliver a d'Arsonval current of good quality and up to 2000 ma., a machine showing a high meter reading with a comparatively low sparkgap being preferable. The physiologic effect of diathermy is to produce a temporary active congestion, dilating the capillaries and increasing the speed and volume of the local circulation. In febrile conditions, such as pneumonia, there is little further increase in temperature during treatment, and blood-pressure is slightly reduced. The author's patients were merchant seamen averaging about 35 years of age. In this group the expected mortality is about 40 per cent. In the group treated by diathermy the death rate was 20 per cent., while in a similar control group, treated without diathermy, it was 42.9 per cent. In a number of cases treated outside the hospital the average mortality was less than 12 per cent.

The characteristics of influenzal pneumonia were studied by Cuatrecasas Arumi and Trías de Bes (Rev. españ. de med. y cir., Aug., 1923). This form of pneumonia, which is usually produced by the pneumococcus, may develop rapidly or slowly and is frequently atypical. Its temperature curve is not characteristic, and the symptoms are very variable. Treatment with serum does not induce a crisis. While crepitant râles may

simulate those of bronchopneumonia, the patient appearing somewhat asphyxiated, septicemia often accompanies influenzal pneumonia. In the author's cases, the antipneumococic serum made by the Pasteur Institute proved effective in 2 daily doses, each of 40 to 80 c.c., administered intravenously.

In a series of cases C. N. B. Camac (Amer. Jour. Med. Sci., Oct., 1923) administered antipneumococcus serum as soon as the diagnosis was made, without waiting for the sputum test. In addition, polyvalent serum was given in all cases of lobar consolidation, of whatever cause. Subcutaneous injections of 2, 3 and 5 c.c. of serum were made at intervals of 1 or 2 hours for the purpose of desensitization. About 1/2 the cases had signs of serum sickness for 2 to 10 days. The mortality among the cases receiving serum was 13.9 per cent., as against 29.8 per cent. in untreated non-epidemic cases and 66.7 per cent. in untreated epidemic cases.

POLIOMYELITIS, ACUTE.— DIAGNOSIS.—F. Clarke and A. G. Dow (Jour. Amer. Med. Assoc., Aug. 9, 1924) urge the importance of the early recognition of this affection before the onset of paralysis. The disease should be borne in mind from June to November each year. During this period every case of slight illness in children should be regarded with suspicion, and careful clinical search made for a possible poliomyelitis. The most important single diagnostic sign is neck rigidity. The subjective symptoms, which none too reliable, include vomiting, constipation, coryza, bronchitis, irritability, drowsiness and convulsions.

The tonsils are red and hypertrophied. Fever is rarely higher than 100 to 101° F. (37.8° to 38.3° C.). In the early cases there is a general hyperesthesia which makes the child resist being handled. As for a spinal fluid cell count, this is important in each case, but if negative it should not be allowed to offset positive clinical findings.

According to Ducamp, Gueit and Didry (Presse méd., Aug. 9, 1924), the different forms of pain, accompanied by fever, in acute anterior poliomyelitis depend on the area of the cerebrospinal axis in which the virus locates. Transient pains, disappearing as paralysis occurs, are signs of an affection in the posterior horns. Persistent pains, coexisting with paralysis, are rarely generalized, and are due to disturbances in the sensory nerves with meningitis and a tendency to chronicity. Persistent pains, localized in certain nerve trunks, are produced by motor and sensory neuronitis.

A case of infantile paralysis was observed by A. L. Hall (N. Y. State Jour. of Med., Jan. 30, 1925) in a man aged 80. The symptoms were pathognomonic.

#### ETIOLOGY AND PATHOLOGY.

—The prevalence of infantile paralysis in the United States over a period of 11 years (1912-1922) was studied by Aycock and P. Eaton (Amer. Jour. of Hyg., July, 1924). They found that there was a marked regularity in the summer prevalence of the disease. A definite secondary increase usually occurred in March or April with fair regularity from year to year, and with a certain degree of uniformity in all parts of the country. This suggests the possibility of 2

modes of transmission of infantile paralysis.

In the epidemic of poliomyelitis in Istria, according to Gioseffi (Rif. med., Sept. 1, 1924), there were cases of paralysis simultaneously in fowls, pigs and dogs. An apparently atypical epizoötic of chicken cholera associated with weakness or paralysis might have been of the same source.

Collapse of the lower lobes of both lungs in poliomyelitis was observed by J. C. Regan (Lancet, Dec. 13, 1924). The collapse was massive, involving first 1 side and later the other. Atelectasis in poliomyelitis is a complication of considerable rarity, and could not have been produced by any of the commonly recognized causes of the condition.

R. von Hoesslin (Münch. med. Woch., Dec. 26, 1924) observed a case in which the infection could be traced to a girl convalescent after poliomyelitis. She proved to be the carrier of contagion at least 9 or 10 weeks after the onset of her attack.

TREATMENT. - The treatment by X-rays has been commended by various authors. Combined diathermy and Roentgentherapy in anterior poliomyelitis was employed by Bordier (Jour. de radiol. et d'électr., Dec., 1923) in 3 chronic It led to nearly complete restoration of the affected muscles. In 3 acute cases, it gave results much superior to those obtained with other forms of treatment. He states that in 16 acute cases treated by Bergamini, results were very good in 4, good in 8, and medium in 4. Serena obtained a remarkable result in a grave case of bilateral paralysis of the legs, and other writers have also reported success. X-ray treatment is applied to the cord, the rays being directed in the plane of the spinous processes or traversing the lamellæ at an angle of about 36° with the first-named position.

In the treatment of acute poliomyelitis F. Sabatucci (Policlin., Nov. 1, 1924) considers the **X-ray** treatment as the best, *if applied early*. Its action is probably chiefly due to decompression by absorption of the exudate. Diathermy and rhythmic galvanization are also useful.

Svejcar and Dreuschuh (Casop. lek. cesk., Jan. 3, 1925) also report complete recovery from the poliomyelitis paralysis within 5 months in a girl 7 years of age. They used Bordier's method. Turano (Pediatr., Sept. 15, 1924) irradiated with **X-rays** the affected parts of the cord, and confirms Bordier's results. If applied early, he urges, there is no better method of treatment.

During a recent local epidemic, Clarke and Dow (loc. cit.) had 17 cases, all of which received 1 or more injections of Rosenow's serum. In every instance in which early diagnosis was possible, recovery was complete without paralysis. Since it is at present impossible for the clinician to forecast which case will be of the abortive type and which will not, early serum treatment offers the only rational therapy.

Flexner and Amoss (Jour. of Exp. Med., May, 1924) obtained from a rapidly fatal human case a strain of the virus of poliomyelitis which exhibits mild degrees of infective power and marked degrees of protective effect for the monkey. While Macacus rhesus displays perceptible differences in susceptibility to the attenuated virus, nearly all the animals responded to the inoculation and none succumbed to the infection induced. The

modified disease observed was distinguished by its relatively benign nature and its tendency to end in recovery.

POLYCYTHEMIA.—Ten cases were studied by L. F. Verity (Med. Jour. and Rec., Oct. 1, 1924). In 1, in a man of 51 years, there had always been a tendency to weakness, fainting spells and excessive perspiration, with occasional attacks of vertigo, fulness in the head, yawning, soreness and tingling and burning in the tips of the fingers and toes. The patient tired easily and complained of increasing nervousness and irritability. Cyanosis of the mucous membranes developed, and the spleen extended 2 inches below the costal margin. In 26 hematologic examinations the erythrocyte count varied between 5,120,000 and 11,050,000, the leukocyte count between 8400 and 23,400. The lowest hemoglobin reading was 86 per cent. and the highest 216 per cent. This disorder may occur between the ages of 36 and 70. Men are more frequently affected than women, 8 of the author's 10 patients being men.

The 3 characteristic signs of the disease are cyanosis (inconstant), polycythemia and splenomegaly. Nervous symptoms predominate, neurologic manifestations being dominant in 8 of the writer's cases. There was also headache and fulness in the head, numbness and tingling of the extremities, paralysis, yawning and excessive perspiration. The basal metabolism was estimated in 6 cases, in 4 of which it ranged from +8 to +24. Ophthalmoscopic examination in 4 of 5 cases showed constant changes, namely dark-colored, dilated retinal veins. The postmortem findings reported by various writers have revealed an extreme distention of all the minute vessels of the body with blood. The arteries of medium size show moderate sclerosis. There is generally some hypertrophy of the left ventricle. The spleen is enlarged, without any marked pathologic change.

Treatment is necessarily empiric, but various therapeutic measures are known to give relief. Venesection produces temporary alleviation, but no permanent benefit. Radium therapy should be directed to the terminal ends of the long bones in destructive doses, in an effort to prevent erythropoietic production, and in stimulating doses to the spleen, to promote erythrolysis. At present all drugs with the exception of benzol have been discarded. In the writer's cases X-ray treatment applied over the splenic area resulted in a slight drop in the erythrocyte and leukocyte counts and a temporary reduction of symptoms. Benzol neither alleviated the symptoms nor affected the hematologic picture.

### PREGNANCY.—TOXEMIA.—

Hypertension betokens the possible presence of toxemia in pregnancy, as noted by V. le Lorier (Presse méd., Jan. 6, 1923), who measured the blood-pressure as a routine in pregnant women. A pressure of 120 mm. Hg he regards as the warning line. If a pressure which has been below this starts to rise, other symptoms of toxemia may be expected soon if the patient remains without rest and dieting. At 150 mm. Hg albumin appears in the urine and eclampsia is imminent. Since toxemia can usually be prevented by rest and a milk-

vegetable, salt-free diet, it is very important to look for this early sign.

In a study of 523 pregnant women, R. D. Mussey and L. M. Randall (Minn. Med., Sept., 1924) found that 104 had at some time during their pregnancy a systolic pressure of 140 or more. He considers such hypertension a fair index of the onset of toxemia. Of the patients with hypertension below the age of 30, 72 per cent. had toxemia, while 54 per cent. of those with hypertension over the age of 30 had toxemia.

According to F. S. Kellogg (Amer. Jour. of Obst. and Gyn., Sept., 1924), after a study of 450 cases, recurrent toxemia of pregnancy is a clinical entity distinct from chronic kidney disease complicating pregnancy and from the acute single toxemia of pregnancy. His newer group consists of patients who have a faulty kidney balance, which allows them to live without kidney manifestations when not pregnant, but who, when pregnancy is added, develop kidney insufficiency. group is subdivided into 2 classes: (a) Those in which the prognosis under the strictest possible prenatal care is good both for mother and child; (b) those in which the prognosis for the child is bad.

A study of the after-effects of late toxemias of pregnancy by J. W. Harris (Johns Hopk, Hosp. Bull., Apr., 1924) provided valuable data. Of 42 mothers discharged from the hospital entirely free from signs and symptoms of the disease, 27 returned for study 1 year later. While in 24 no evidence of renal damage could be found, 3 showed positive signs of chronic nephritis. This shows that chronic nephritis is a possible sequel of eclampsia, but also confirms the

view that 1 attack of eclampsia confers at least a relative immunity against its occurrence in subsequent pregnancies. Preëclamptic toxemia was met in 83 cases. None of these showed the existence of chronic nephritis during the pregnancy or puerperium in question. On their discharge all of these patients were free from symptoms of the disease. Of 55 patients, 33 at the end of 1 year had signs of chronic renal involvement. The incidence of chronic nephritis was twice as great in multiparæ as in primiparæ. These findings illustrate the incorrectness of the generally accepted view that preëclamptic toxemia rarely eventuates in chronic nephritis.

VOMITING.—H. E. Miller (New Orl. Med. and Surg. Jour., May, 1924) employs luminal sodium whenever the vomiting is not amenable to simple measures. Of 10 patients, 5 were retaining possibly 1/3 of the food ingested, but were losing strength and weight. The other 5 were undoubtedly instances of pernicious vomiting, and had the routine measures of proctoclysis, hypodermoclyglucose infusions, starvation treatment and glandular therapy, with little or no result. The same treatment was employed in all cases; 2 grains (0.13 Gm.) of the luminal sodium were given 1 hour before each meal and at bedtime, all by mouth, except in 3 cases, in which the 1st doses were given hypodermically, the patient being instructed to resume her ordinary diet. In 1 case, about 3/4 of the food taken during the first 24 hours was retained, after which there were no further attacks of vomiting; in every other case the relief was immediate.

Thalhimer (Surg., Gyn. and Obst., Aug., 1924) used insulin in the toxemic vomiting of pregnancy in 8 patients. It was combined with the intravenous administration of glucose. All the patients showed a marked ketonuria. One had a moderately severe acidosis; 3 hours later, at the end of the intravenous infusion of glucose and the administration of insulin, the blood plasma carbon dioxide combining power was 48, and 19 hours later it was 69. This rapid eradication of ketonuria and acidosis seemed to cause relief of the nausea and vomiting in non-diabetic patients.

P. Castagna (Policlin., Feb. 25, 1924) treated 5 women with incoercible vomiting with intravenous injections of 2 c.c. (32 minims) of a 35 per cent. solution of calcium chloride. This arrested the emesis after from 1 to 3 injections.

In a case reported by Haden and Guffey (Amer. Jour. of Obst. and Gyn., Oct., 1924), subcutaneous administration of sodium chloride in large amounts was followed by an immediate cessation of toxic symptoms and a return of the blood and urine to normal. The blood findings suggested that some at least of the toxemias of pregnancy are similar to the toxemia of intestinal obstruction. The blood chlorides in this case had been found very low.

Of 36 cases in which G. F. Wilson (So. Med. Jour., June, 1924) used sodium bicarbonate intravenously—350 c.c. (12 ounces) of a 3 per cent. solution—15 recovered rapidly.

Denyer (Brit. Med. Jour., Sept. 13, 1924) advocates: (1) Rest in bed; (2) gastric lavage with a solution of sodium bicarbonate, 1 dram (4 Gm.) to the pint (500 c.c.), 1 or 2 pints (500 to 1000 c.c.); (3) epinephrin, 5 minims (0.3 c.c.) hypodermically

every 3 hours for a few doses until the vomiting ceases, or by mouth in doses of 10 to 20 minims (0.6 to 1.25 c.c.) in a little water; (4) feeding by rectal salines containing from 1/2 ounce (15 Gm.) upwards of glucose to the pint (500 c.c.), with a small quantity of sodium bicarbonate added if there is any diacetic acid in the urine; (5) addition to the evening salines of 30 grains (2 Gm.) of potassium bromide to promote sleep and reduce irritability of the nervous system; (6) a gradual increase in feeding by the mouth, beginning with small quantities of water.

PROSTATE.—H. Lisser (Endocrinol., Mar., 1923) made a study of the effects of absence of the prostate on endocrin disease, notably hypopituitarism. In 8 cases of preadolescent hypopituitarism of the Lévi-Lorain type of infantilism, the prostate was absent in 6 and very small in 2. Out of 5 cases of preadolescent hypopituitarism of the Fröhlich type, in 4 the prostate was absent, and in 1, small. He also studied 2 cases of dyspituitarism, gigantism and infantilism, Neurath-Cushing type, and 3 cases of eunuchoidism. He concluded that (1) the prostate does not develop if castration is performed early in life; (2) though normally developed, it will atrophy and eventually disappear if castration is performed in the adult; (3) castration has no effect on the hypertrophied prostate; (4) in hypogonadism or eunuchoidism the prostate atrophies; (5) Goetsch showed that feeding the anterior lobe of the pituitary to young rats hastens the development of the prostate; (6) many investigations have shown that experimental hypopituitarism is followed by sex infantilism, including retarded development of the prostate; (7) in clinical hypopituitarism in the male, the prostate fails to develop if the disease begins before puberty, and atrophies if it has its onset after puberty.

CANCER.—According to Barringer (Ann. of Surg., Dec., 1924), radium needles afford the best results in the treatment of prostatic carcinoma. They are inserted into the prostate and seminal vesicles; the procedure is repeated every 2 to 3 months until sclerosis of the carcinoma occurs. If there is urethral invasion, urethral treatment is added.

PROSTATECTOMY.—According to Syms (N. Y. State Jour. of Med., Sept., 1924), the median perineal prostatectomy, under sacral anesthesia, is the safest procedure at our command. Torchiana (Archiv. ital. di chir., Oct., 1924) found it a comparatively simple matter to divert the sperm in dogs by implanting the vas deferens in the urethra.

Lieschied's (Zeit. f. urol. Chir., Oct. 3, 1924) investigation of 50 men who had had the prostate removed by Voelcker's method confirmed that the operation in itself had not affected the power of cohabitation unfavorably. A. Strauss (Jour. of Urol., Aug., 1924) showed experimentally, however, that either the prostate or the seminal vesicle is necessary for natural impregnation in the white rat, as removal of both makes the male sterile.

PROTEIN THERAPY.—Danysz (Presse méd., July 19, 1924) states that this form of therapy is looked upon with suspicion because it has not been satisfactorily explained. Yet it has been found that in tuberculosis, for example, the hypodermic or intradermal injection of cow's milk may produce the same pathologic and therapeutic reactions as tuberculin. In most cases of chronic non-contagious infections the patients possess a variable degree

of hypersensitiveness capable of being evoked by any antigenic substance. This hypersensitiveness can only be of an anaphylactic nature, i.e., developed by substances or factors acting as direct or indirect antigens. The author illustrates this by several cases of asthma of different origin which were all cured by the administration of a vaccine prepared with the normal bacterial flora of the intestine. He found that it was not essential to induce a "shock" in order to obtain a satisfactory therapeutic result, and that a stock vaccine prepared with a mixture of the bacteria normally present in the intestine gave the same results as an autogenous vaccine. After experimenting with relatively high doses Danysz used dilutions representing only 1/10,000 of the quantities formerly administered by him (0.001-0.00001 mgm. of dry substance.) The vaccine was also heated several times to 100° C. instead of 60 to 65° and administered in very small quantities of liquid (0.1 or 0.05 c.c.) in order to avoid the reactions which even pure physiologic salt solution sometimes produces in hypersensitive individuals. Even these very small doses may cause slight morbid reactions in cases of asthma, urticaria, eczema, etc., but they prove generally quite as efficient as the much stronger shock-producing doses previously used. Larger doses by mouth give similar pathologic and therapeutic reactions.

R. Schmidt (Med. Klin., Nov. 30, 1924) states that the beneficial effect of protein therapy in many patients with gastric or duodenal ulcer is undeniable. It seems that functional affections of the digestive apparatus are also well influenced. He had good results in pylorospasm and gastric crises. Chronic colitis and cholecystitis are also amenable. Combination of thyroid tablets with milk injections and a colon bacillus vaccine was successful in constitional obesity. Mild diabetes may be treated with injections of proteins. They have rather an unfavorable action on acidosis. The asthenic type of diabetes in young persons is characterized by an absence of the thermic reaction to these injections. Insulin treatment restores the ability to react with fever. A tendency to urate deposits and cholesterolemia are also indications for protein therapy.

Pruritus

PRURITUS.—According to K. Kroner (Klin. Woch., Feb. 26, 1924), itching originates in special nerves which belong to the vegetative nervous system, and is independent of hyperesthesia or hyperalgia, as it persists even after the application of cocaine. It disappears, however, under the effects of drugs acting on the blood-vessels, such as atropine and calcium. X-rays or a quartz lamp also have a favorable effect.

L. Haas (Wien. klin. Woch., Dec. 25, 1924) considers pruritus of endocrin origin. The X-ray has given good results. He recalls that many of these patients enjoy the scratching and recommends psychotherapy.

Autohemotherapy was used by Carrera (Prensa med. Argent., June 30, 1924) in 40 cases. It proved exceptionally effectual in idiopathic pruritus and furunculosis. It cured a case of vulvar pruritus that had resisted all other internal and external measures 4 years. J. W. Miller (Ohio State Med. Jour., Dec., 1924) in stubborn cases had good results from intravenous injection of Ringer's solution at room temperature in amounts varying from 60 to 250 c.c. (2 ounces to  $\frac{1}{2}$ pint). When the larger amounts were used, venesection followed by an infusion was preferred. Sharp reactions occasionally occurred which seemed to be beneficial, the results being more uniform. Chronic, generalized itching dermatoses (essential pruritus) were frequently benefited. In a number of instances the author employed the patient's own serum in Duhring's disease. There was immediate cessation of itching, and although relapse eventually occurred, the nervous manifestations seemed to be definitely ameliorated. The patients received 20 to 75 c.c. of blood serum at intervals of 4 or 5 days. From the blood collected in tubes the clot was separated after 10 minutes with a sterile hatpin or glass rod and the blood then centrifugated at high speed for 30 to 40 minutes. The serum, amounting to 40 to 45 per cent. of the blood originally collected, was then carefully withdrawn with a glass syringe and at once injected intramuscularly or intravenously.

G. B. Podestà (Policlin., Oct. 6, 1924) also obtained relief with autohemotherapy and intravenous injections of sodium silicate. In a few patients, 6 to 12 injections of 5 to 10 c.c. (1½ to 2½ drams) of a 0.5 per cent. solution of acriflavin seemed to be the best treatment.

Pulay (Deut. med. Woch., Nov. 21, 1924) observed 2 cases—1 in a child with *ecsema*; the other, in a woman after *naphthalin dermatitis* with low water elimination, in which the itching disappeared after diuresis had been obtained by theobromine sodiosalicylate and thyroid gland.

**PSORIASIS.** —Strickler and Asnis (Arch. of Derm. and Syph., Oct., 1923) found a marked *lymphocytosis* in 54 per cent. of the blood smears of patients with psoriasis. The other white blood cells were found in practically normal proportions.

J. F. Schamberg (Jour. Amer. Med. Assoc., Oct. 18, 1924) studied the histories of 592 private patients with psoriasis who were under his care. In 67 per cent. the disease had begun between the ages of 11 and 30 years. In 87 per cent., no other member of the family was affected, and in 95 per cent. there was no ancestral history of psoriasis. There

were 2 instances of husband and wife suffering from the disease. The vast majority of psoriasis patients are better in the summer and worse in the cold seasons. The disease is extremely rare among the colored. It is also rare in the Orient and in the tropics. There is no special habit of body nor any nutritional disorder associated with psoriasis; neither is the disease due to nervous system derangements nor endocrin abnormalities. The remaining hypotheses as to etiology-metabolic and parasitic -can neither be affirmed nor denied. The eruption of psoriasis pursues a cycle: There is a stage of progression or active evolution, followed by a stage of quiescence, and at times a stage of spontaneous involution or regression.

The most essential principle in the treatment is the conversion of the active into an inactive or quiescent stage. The previously ineffectual remedies then become effective. One measure that tends to bring about a subsidence of the psoriatic process is a low protein diet, i.e., 1 containing about 4 Gm. of nitrogen a day. Other therapeutic agencies that have been employed include the intravenous injection of vegetable proteins, the injection of an enterovaccine containing chiefly the fecal streptococcus and colon bacillus, the subcutaneous or intravenous injection of a typhoid or colon bacillus vaccine, and finally, autoserum injections which tend to inactivate psoriasis and aid in bringing about a state of quiescence. All other procedures induce a leukocytosis, proportionate in large part to the degree of reaction evoked. During this stage the X-rays, chrysarobin and

other measures promptly effect a disappearance of the eruption.

During the last few years, H. E. Alderson (Arch. Derm. and Syph., July, 1923) has treated a large number of cases of psoriasis locally with the mercury quartz lamp. This proved a relatively satisfactory and cleanly method. While it is not invariably successful, the psoriasis lesions clear up more effectively than under any other form of treatment except the X-rays. The writer, however, prefers the former; recurrences are longer delayed after successful ultra-violet light treatment. It is safer and more desirable when the scalp is involved. It is also preferable to chrysarobin ointments.

K. Gawalovski (Ceska Dermatol., iv, 94, 1923) applied the X-rays to the thymus gland in 82 psoriatic patients. Good results followed in 66 per cent.; but recurrence took place more frequently than after local raying of the patches of eruption.

## PUERPERAL ECLAMPSIA.—

Having found that the eyes are involved in over 90 per cent. of all cases of pregnancy as a result of the physiologic enlargement of the pituitary body, which causes different degrees of contraction of the visual fields through pressure on the optic commissure and tracts, L. Mills (Amer. Jour. of Obst. and Gyn., Mar., 1924) advocates systematic examination of the visual fields and eyegrounds of all women who suffer late in pregnancy from headache, nausea and vomiting, abdominal distress, and renal or hepatic disturbance. symptoms just mentioned, hitherto assumed to be preëclamptic, frequently occur without renal or

hepatic disturbance, and the separation of the cases into those of pituitary origin and those of genuine toxemia of pregnancy must be based largely on the eye examinations.

PROPHYLAXIS.—According to W. Gessner (Zent. f. Gyn., Dec. 13, 1924), the reduction of incidence of eclampsia noted during the World War was due to a scanty diet, low in proteins and fats, which made less demands on the oxidizing powers of the system. The reduction of incidence was mainly among working women. The best prophylactic measure, he maintains, is outdoor exercise to accelerate the gaseous interchanges.

Wieloch (*Ibid.*, Apr. 26, 1924) ascribes eclampsia to abnormal permeability of the vessel walls, the resulting edema in the brain causing the convulsions. He combats the abnormal permeability by giving intramuscular injections of 5 c.c. (80 minims) of a solution of gelatin or 10 c.c. (160 minims) of a 5 per cent. acacia-Ringer solution. Among the effects noted frequently was a marked reduction of body weight.

Prophylactic treatment by artificial heliotherapy with the quartz lamp is advocated by Hochenbichler (Mon. f. Geb. u. Gyn., Apr., 1923), the aim being to reduce the blood-pressure as term approaches. The whole body is exposed to the light at a distance of ½ meter, the duration being limited at 1st to 5 minutes for each region. Favorable effects on the blood-pressure and capillary circulation were seen in preëclamptic cases as well as, at times, during eclamptic convulsions.

TREATMENT.—Stroganoff (Jour. of Obst. and Gyn. of Brit. Emp., xxx, 1, 1923) describes an improved method of treatment. His aim is by all means to prevent repetition of the

convulsive seizures, on the ground that each one brings the patient nearer death. All sources of irritation are removed and the patient kept secluded in a dark, quiet room. To reduce the seizures gradually or, if possible, prevent their recurrence, he injects morphine hydrochloride, 0.015 Gm. (1/4 grain), and gives chloroform. In 1 hour's time, chloral hydrate, 2 Gm. (30 grains), is also given, in addition to 200 to 250 c.c.  $(6\frac{2}{3})$  to 8 ounces) of saline solution by rectum and, if the patient is conscious, 100 c.c.  $(3\frac{1}{3})$  ounces of milk by mouth. In 3 hour time, the morphine is repeated, usually under chloroform; after 7 hours, chloral hydrate again; after 13 hours, chloral hydrate, 1.5 Gm. (23 grains), if there have been no fits for 12 hours and there are no prodromes, and after 21 hours, chloral hydrate again under the same conditions. Thus in 1 day the patient receives 5 to 9 Gm. of chloral hydrate, 0.02 to 0.04 Gm. of morphine, chloroform repeatedly, and 500 c.c. each of milk and saline solution. Labor may be hastened by forceps or extraction when conditions are favorable. Stimulation by digitalis, digalen, caffeine, camphor, etc., is in many cases necessary. Venesection, 400 c.c., often relieves the heart and oxygen may be given. Hot-water bottles are placed about the feet and kidneys. To prevent hypostatic pneumonia, the patient is turned from side to side. these measures he claims a mortality of only 1.07 per cent. and a fetal mortality of 5 per cent.

Neither interruption of pregnancy nor, ordinarily, any effort to hasten labor is countenanced by A. C. Beck (Amer. Jour. of Obst. and Gyn., June, 1924), who favors venesection, 1000 c.c., unless the blood-pressure falls to 100 or the pulse rapidly changes, when the venesection is stopped. The results are so striking that other eliminatory measures are dispensed with, except for colonic irrigations once daily. Morphine, 1/2 grain (0.03 Gm.), is given at once on admission and is repeated in 1/2 this dose hourly until the convulsions cease or the respirations are markedly lowered. To avoid disturbance to the patient, the venesection, hypodermics, etc., are carried out during the coma following a convulsion. P. Zweifel (Zent. f. Gyn., Sept. 29, 1923) likewise favors venesections, up to 1400 or 1800 c.c., and reports 63 eclamptics treated by venesection after delivery, all recovering. Salen, Chabert and Gavaudan (Rev. franç. de gyn., Feb. 10, 1924) found venesection, 600 c.c., sufficient in 5 cases, without the use of sedatives.

According to Hülse (Zent. f. Gyn., May 31, 1924), eclampsia is attended with a contraction of the arterioles, due to peptone in the blood, which raises the blood-pressure and is followed by ischemia of the brain, coma and clonic convulsions resulting. F. Volhard (Mon. f. Geb. u. Gyn., May, 1924) endorses Hülse's explanation that peptones, while relatively nontoxic, indirectly cause vascular contraction. He prefers intravenous injections of magnesium sulphate, up to 8 Gm. (2 drams), in a 2 per cent. solution, to morphine and chloral hydrate.

Lévy-Solal and Tzanck (Presse méd., Aug. 1, 1923) found 2 toxic bodies in the serum of eclampsia patients, the 1 inducing a slow kind of intoxication in animals, and the

other, a sudden, rapidly fatal disturbance with convulsions and features suggesting anaphylactic shock. A small preparatory dose of the same eclamptic serum, or addition of pilocarpine, protected against the latter type of intoxication. Injecting 0.005 Gm. (½2 grain) of pilocarpine hydrochloride in a woman who had had 9 convulsive seizures, they witnessed no further recurrence of the convulsions—a result ascribed to modification of vagosympathetic tone.

In a case recorded by J. A. Beruti and M. Isaac (Sem. méd., Jan. 29, 1925), the convulsions did not begin until the 8th day after normal labor, appearing abruptly and with fever. Curettage of the uterus, with evacuation of adherent, fetid portions of placenta, after 45 convulsions had occurred, was followed by gradual recovery.

Convulsions continued even after delivery in a case reported by Niedermeyer (Deut. med. Woch., June 8, 1923), but decapsulation of one kidney, after coma and anuria had been present several hours, brought the patient through.

PUERPERAL INFECTION.—PROPHYLAXIS.—According to Corby (Brit. Med. Jour., Sept. 27, 1924), prolonged recumbency after labor is a factor predisposing to puerperal sepsis. The lochia stagnate in pools in both the uterus and vagina, forming forcing beds for bacteria. The retained lochia, as a foreign body, also interferes with involution, leaving the cavity larger, with freer entrance for bacteria. The writer instructs his patients to sit up at stated intervals in bed, with asserted good results.

Hauch (Gyn. et Obst., July, 1923) notes that virulent streptococci are sometimes found before and after delivery in the vagina of women who are normal in every way. If transferred to another parturient, these germs may bring on a catastrophe. He isolates all parturients, and has the room disinfected after the patient is transferred to the ward for the puerperium. Prophylactic serum and vaccine therapy may be availed of, giving results sufficient to encourage further trial.

In every woman with an abnormal vaginal secretion, R. Salomon and S. Bieringer (Klin. Woch., Sept. 16, 1924) employ daily vaginal irrigations with 500 c.c. (1 pint) of 0.5 per cent. lactic acid solution for 2 weeks previous to the expected labor. A complete change in the vaginal flora results during this time, and in no case treated in this manner has sepsis developed.

R. S. Siddal (Surg., Gyn. and Obst., Feb., 1925), before delivery, has the pubic and vulvar hairs clipped and paints a diluted (2 per cent.) tincture of iodine over the vulva, perineum, lower part of the abdomen, inner sides of thighs, and the part of the head in view. The smarting produced by the application of iodine is obviated by the dilution and a few whiffs of nitrous oxide. spontaneous labors thus dealt with, there was a febrile puerperium in only 4.5 per cent. Instead of the iodine, 2 per cent. aqueous solutions of mercurochrome or meroxyl, neither of which causes burning on application, may be used. The former stains the sheets, however, while the latter, being colorless, calls for addition of, e.g., alizarin, to show the area concerned has been covered.

C. Robertson (Ibid.) quotes G. Luker, of the London Hospital, to

the effect that quinine given intravenously will prevent septicemia.

TREATMENT.—Out of 2096 parturients observed by B. P. Watson (Brit. Med. Jour., Mar. 24, 1923), 476 showed puerperal morbidity, but in only 50 could a definite septic lesion in the pelvis be discovered. avoids local treatment unless the indications are definite. If no lesion, such as a stitch infection, can be found in the cervix or pelvic floor, the uterus is probably infected. He deprecates insertion of fingers or instruments into the uterus at any time to remove pieces of membrane or placenta unless there is excessive hemorrhage, and also deems intrauterine douching harmful. For uterine drainage, the Fowler position is best. An ice-bag to the abdomen often allays pain and fever; the bowels should be kept open, a free liquid diet given, and the patient kept in the open air. Blood cultures should be taken regularly, but no swabs from the uterus. If foul lochia accumulates in the vagina a gentle vaginal douche may be given. Most cases do well under this treatment, and cases of cellulitis recover in time. When suppuration occurs the pus must be evacuated through the vagina or extraperitoneally through the abdominal wall. If thrombophlebitis develops the ovarian or common iliac veins should be ligated.

When fever in the puerperium is not ascribable to extrapelvic infection, J. R. C. Canney (*Ibid.*, Aug. 30, 1924) favors induction of anesthesia and examination of the pelvis. If intrauterine sepsis exists, the uterus should be emptied or cleansed or both. The modified Dakin-Carrel treatment, assisted perhaps by drugs.

Puerperal Infection

will help involution better than any other measure, and in early adnexal infection may obviate abdominal section. If antistreptococcus serum is to be used, it should be given frequently until the temperature falls. Further adjuncts are peptone shock and eusol intravenously. Endometrial and blood cultures should be taken, as later a vaccine may be of value.

B. Whitehouse (Lancet, May 31, 1924) gives antistreptococcus serum intravenously in large doses, diluted with an equal quantity of salt solution. The initial dose is 50 c.c. of serum, and 1 c.c. of fresh guinea-pig serum is also given, to introduce complement. On the 2 succeeding days 30 c.c. of serum are given. Autogenous vaccines are used, and in severe systemic infection acriflavin, 1:250 in salt solution, 20 c.c. (5 fluidrams) intravenously, is given morning and evening.

In 11 out of 14 cases of acute puerperal fever in which H. Bailey (Amer. Jour. of Obst. and Gyn., July, 1924) employed polyvalent antistreptococcus serum, subsidence of temperature and gradual recovery followed. The corrected death rate was 15.3 per cent. Louros (Münch. med. Woch., July 27, 1923) gave 8 women with streptococcal sepsis and 3 with staphylococcal sepsis autogenous vaccines intravenously, all recovering.

In 4 cases, G. Salvén (Acta gyn. scand., iii, 55, 1924) witnessed a drop in temperature, disappearance of local tenderness, and improved general condition, with recovery, following intrauterine irrigations with Dakin's solution. Good results were also obtained in septic abortion. P. Perazzi (Clin. ostet., xxvi, 438, 1924) describes a device providing for regular intermittent irrigation of the

uterus with sodium chloride or sodium hypochlorite solution, of which 20 c.c. are injected every 20 to 25 minutes. Cessation of odor and a general improvement usually follow.

Considerable interest has been aroused by the effects of intravenous injection of various chemicals in septic states. Piper (Amer. Jour. of Obst. and Gyn., Nov., 1922), finding in animals that intravenous injections of mercurochrome seemed to have a germicidal effect on local streptococcic lesions, gave 25 c.c. of a 1 per cent. solution of the drug in distilled water per 100 pounds of body weight in a number of cases of puerperal sepsis. The solution used must be absolutely clear. A reaction follows, consisting of vomiting, diarrhea, a marked chill and temperature of 105° F. in the 1st 6 hours. The pulse and temperature next drop to subnormal, returning then to normal or slightly above normal, where they should stay for 24 to 48 hours. The diarrhea may call for a bismuth mixture. urine and stools being watched, repeated doses may be given (up to 5 in 1 case). The conclusion reached is that the measure may, in some cases, be of great value.

Combined intravenous injection of neoarsphenamin and mercuric chloride is lauded by Kiehne (Zent. f. Gyn., Mar. 17, 1923), who reports a resulting reduction of mortality below 10 per cent. The arsenical, 0.3 Gm., is dissolved in 5 or 6 c.c. (80 or 96 minims) of water, 2 c.c. (32 minims) of 1 per cent. bichloride added, and the whole amount injected. A 2d injection may be given 2 or 3 days later, and, if required, further injections, up to 5, at longer intervals. Küstner (Deut. med. Woch., Feb. 6,

1925) reports fair results with the same treatment.

C. Robertson (Surg., Gyn. and Obst., Feb., 1925), of Auckland, N. Z., is convinced of the value of intravenous injections in severe septic states, at least in some cases, and urges the practitioner to resort to this measure in almost any severe case without waiting for the results of blood cultures. He injects, as an average dose, 50 c.c.  $(1\frac{2}{3})$  ounces of freshly prepared eusol, a product akin to Dakin's solution. The reduction of mortality upon introduction of the treatment in the Auckland Hospital was very remarkable and precluded all doubt of its efficacy. Drugs other than eusol may possibly be even more efficacious. G. Luker is quoted to the effect that the mortality of puerperal septicemia in the London Hospital decreased from 32 to 5 per cent. since the use of quinine intravenously. Intravenous injection is also a valuable prophylactic. Suspected cases can be prevented from developing into possible fatal sepsis, and for some years it has been the custom among the obstetricians of Auckland to give doses of eusol in all cases of postpartum temperature.

Milk injections are deemed valuable by G. Gellhorn (Amer. Jour. of Obst. and Gyn., Nov., 1924) in gynecologic infections, particularly gonorrheal, as well as in puerperal infection. The usual initial dose he gives is 5 c.c. (80 minims), unless there is great weakness or high fever. The standard dose, 10 c.c. (160 minims), is reached with the 2d or 3d injection and then maintained, to an average total of 6 injections. The interval is usually 3 to 5 days, ac-

cording to the reaction; occasionally, 2 days in indolent cases. In mild cases 1 or 2 injections often suffice. A general reaction consisting of a chill and moderate fever generally occurs 6 to 8 hours after the injection, but the writer has had several most satisfactory results in cases with very little reaction. In 24 hours, there is marked euphoria, improved appearance and appetite, and a leukocytosis of 20 to 25,000. The outcome in puerperal sepsis depends altogether on the power of resistance of the organism, and protein injections undoubtedly greatly increase Cardiac decompensation, diabetes and alcoholism are contraindications; whether pregnancy is 1 or not is still an open question. The milk injections should be tried only the cells are not hopelessly damaged and the patient has not reached the condition of complete fatigue.

PURPURA. —Many investigators had reported a complete or almost complete loss of the blood platelets in purpura hemorrhagica, but it was only in 1915, as noted by N. Bagnoli (Gior. ital. d. mal. ven., May, 1923), that Frank 1st qualified this affection as essential thrombopenia and enumerated its salient features as: Hemorrhagic diathesis, non-hereditary; diminution or absence of platelets; prolonged periods of hemorrhage; diminished blood coagulability, and diminished retractility of blood clots. states that owing to a slowing of the blood flow, to stasis, or to vasomotor stimulation, and because of lowered specific gravity of the blood, the platelets, by centrifugal action, are deposited along the vessel walls. The writer reports cases illustrating the features described by Frank.

M. R. Castex (Presse méd., Mar. 29. 1924) refers to cases of purpura hemorrhagica with an absolutely symmetric distribution of the lesions on the trunk and limbs, suggesting disease in the centers concerned in the nutrition of the vessels. Study of the spinal cord of such cases revealed marked changes at various levels in the intermediate lateral sympathetic tracts on both sides, plainly visible in photomicrographs. writer ascribes purpura hemorrhagica to an intoxication of infectious, anaphylactic, metabolic or chemical origin, inadequately dealt with owing to splenic, hepatic, renal or adrenal insufficiency, and operating on the nervous system, in particular the sympathetic. A local predisposition, congenital or acquired, is also deemed necessary.

TREATMENT.—Four cases purpura treated by injection human blood, with gratifying results, are reported by M. Dixon (Brit. Med. Jour., Jan. 6, 1923). The amount was 2 to 5 c.c. (32 to 80 minims). Sterilization of the syringe and needle in magnesium sulphate solution was depended on to prevent clotting. In the case of a male patient aged 18, with purpura, absence of platelets and coagulation and lowered capillary resistance, Meulengracht (Ugeskr. f. Laeger, June 28, 1923) obtained such a good effect from transfusion of blood from the patient's father that he advocates this as a routine measure, to be applied early in severe cases.

According to Castex (loc. cit.), the causal treatment in purpura hemorrhagica consists of stimulation of diaphoresis, diuresis and the intestinal functions. Quinine, strychnine and lipoids may be useful as nerve tonics. Calcium salts serve, not by influencing coagulation, but through antitoxic,

diuretic and antiseptic effects, and likewise through reduction of irritability of the nerve cells, which are thus presumably enabled to rest and gain in resisting power.

In a case of purpura, with almost fatal intestinal hemorrhage, Paisseau and Alcheck (Bull. Soc. méd. des hôp. de Paris, Feb. 16, 1923), upon failure of injections of horse serum, resorted successfully to peptone shock, injecting intravenously 2.5 c.c. (40 minims) of 10 per cent. peptone solution. An abrupt, severe chill occurred at the end of an hour, whereupon 1 mgm. (1/65 grain) of adrenalin was given, relieving the shock within 5 minutes without the production of a febrile reaction.

In a case of postpartum purpura hemorrhagica, with profuse bleeding from the vagina and gums, widespread petechiæ, subperiosteal hemorrhages of the tibias and right-sided hemorrhagic pleurisy, C. Goldmark and A. W. Jacobs (Amer. Jour. of Obst. and Gyn., Aug., 1924), after blood transfusions had brought only transient benefit, employed radium to induce an artificial menopause, with resulting arrest of the disease, which had been present 18 months.

A number of further favorable reports on splenectomy have been appearing. Typical is the case recorded by J. M. Hitzrot (Ann. of Surg., Aug., 1923) in which, after 1 month's treatment with horse serum, transfusions, etc., had failed, splenectomy resulted in immediate cessation of bleeding, reduction in bleeding time and lasting general improvement. N. E. Brill and N. Rosenthal (Arch. of Int. Med., Dec., 1923) recognize the following effects of splenectomy in these cases: (1) Increase of platelets of from 25,000 to 1,500,000; (2) immediate cessation of hemorrhagic tendency, which, in a few cases, may later return in a milder form; (3) a later return of the

platelets to their previous low level, in from a few days to a few weeks; (4) increase of hemoglobin and red cells; (5) apparent cure of the condition. A disturbed function of the capillary walls in this disease is evidenced by purpuric hemorrhages in the legs on prolonged standing and by a positive capillary resistance test. Both of these evidences disappear after splenectomy. Apparently, the spleen exerts an influence, not on the production of platelets, but on their properties of producing clot retraction and of agglutinating to form thrombi.

Mere ligation of the splenic artery seems sufficient to give the desired results, as illustrated in the case of Lemaire and Debaisieux (Bull. de l'Acad. roy. de méd. de Belg., Mar. 29, 1924), in which splenectomy was not risked on account of extreme anemia, and ligation of the splenic artery at the upper border of the pancreas, near the 3d pancreatic branch, was followed by a rise of platelets from 2500 to 238,000 in 16 days and cessation of hemorrhages.

In a case of rheumatic purpura, E. Rautenberg (Deut. med. Woch., Jan. 23, 1923) witnessed rapid disappearance of the red spots, which were not actually hemorrhagic, under intraspinal injections of 4 c.c. (1 fluidram) of a 0.5 per cent. solution of novocaine in normal saline solution.

**PYELITIS.**—Chronic staphylococcic pyelitis is regarded as a distinct clinical entity by J. Hellström (Acta chir. scand., Supp. vi, 1, 1924), who found staphylococci in 30 per cent. of a group of cases representing all types of urinary tract infection. In mixed infections, the original organism was usually the staphylococcus, the colon

bacillus appearing as a secondary invader. Small concretions were found as a complication in 9 out of 60 cases, with staphylococci distributed throughout the stones and apparently concerned in their formation. Staphylococci form ammonia which favors the deposition of calcium salts. Acute and subacute staphylococcic pyelitis yields readily to treatment, but the chronic cases are very resistant. The treatment consists of urinary antiseptics; the use of neoarsphenamin, autogenous vaccines, and pelvic irrigations; measures to modify and acidify the urine, and measures to combat complications, such as prostatitis, focal infections, retention of urine, and stones. Operation for the stones seemed to have as good a prognosis as if they were aseptic.

**DIAGNOSIS.**—Pyelitis in infancy causes only slight, easily overlooked disturbances in micturition, according to A. G. Mitchell (Arch. of Ped., Nov., 1923). Urine examination must be part of a complete study of every sick infant or child. Absence of pus from 1 specimen is inconclusive, pus in quantity often appearing only when the systemic effects improve. The diagnosis will be more accurate if the pus cells per cu. mm. of urine are counted. While, in concentrated non-infected urines, the cells may increase as high as 20 or 30 per cu. mm., if 60 cells are found, infection of the urinary tract certainly exists. Gerstenberger and S. A. Wahl (Ohio State Med. Jour., June, 1924) state that if urine is not obtainable, pain on pressure in the renal region is sufficient evidence for starting medicinal treatment. Prominent symptoms are an erratic change in the child's disposition and an intermittent erratic temperature curve.

TREATMENT.—In pyelitis in infancy and childhood, R. G. Freeman (Arch. of Ped., Mar., 1924) favors alkalinization of the urine for several days as being curative in most cases. If sodium bicarbonate is not effective, alkalinity may be produced with calcium carbonate, sodium bicarbonate and burned magnesia, 5 grains (0.3 Gm.) each every 2 or 3 hours. The treatment should be aided by a vegetable diet, favoring an alkaline urine. Oranges, raisins, apples and bananas are effective in this direction. Each passage of urine should be tested with litmus paper, the latter to be pinned to a note stating the time of passage, and these papers in chronologic order to be brought to the physician with specimens of If the alkaline treatment fails, hexamethylenamin may be given, the urine, if not acid, being acidified with benzoic acid, sodium phosphate, or dilute hydrochloric acid. The drug should be started in doses of but 1/2 grain (0.03 Gm.) for children under 1 year, 1 grain (0.06 Gm.) for those under 3, and not over 2 grains (0.12 Gm.) for those from 3 to 5 years. Such doses may be given 3 times daily, then increased up to large amounts. Cases not thus controlled sometimes respond well to general tonic treatment.

In pyelitis of pregnancy, R. C. Bryan (Va. Med. Mthly., Aug., 1924) is impressed with the results of permanent catheterization of the ureter. A large catheter must be used, 9 to 11 French, and left in situ 24 to 36 hours. If it becomes plugged, irrigation will restore the flow. It may be reinserted at intervals for weeks until

cure results. Copious water drinking, proctoclysis and hypodermoclysis are very valuable, but should be pushed to the limit—up to 6 to 9 quarts in 24 hours-only during drainage of the kidney, lest undue tension in the renal pelvis result. In all forms of pyelitis the writer strongly recommends alternations of reaction of the urine. When alkaline, making it acid may take several days; when it becomes strongly acid, the converse modification is begun at once, and again takes several days. During acidity, the urinary antiseptics are given. Cystoscopy is in order in chronic cases which do not improve.

In colon bacillus pyelitis and cystopyelitis, Beckmann and van der Reis (Zeit. f. klin. Med., Dec. 30, 1924) sometimes witnessed benefit from ammonium chloride, 6 Gm. (90 grains) daily for 3 days, repeated after an interval of 3 to 5 days.

Regarding autogenous vaccines in pyelitis, Jervell (Norsk. Mag. f. Laeg., Feb., 1923) reports 19 cases of colon bacillus pyelitis thus treated, with cure in 6, improvement in 5, and no apparent effect in 8.

Various chemicals have been used intravenously or intramuscularly of late. W. Haupt (Mon. f. Geb. u. Gyn., Oct., 1923) gave 5 to 50 c.c. of a 0.5 to 2 per cent. solution of acriflavin in 30 cases, the amount of drug per injection ranging from 0.1 to 0.4 Gm. Generally 2 injections, 1 day apart, sufficed. Good results are reported. H. Hohlweg (Münch. med. Woch., Oct. 19, 1923) reports bacteriologic cure in over ½ of cases due to the colon bacillus in women by daily injection of 20 c.c. of 0.5 per cent. argoflavin solution for 8 or 9

days, and advocates addition of this measure to the local treatment. Neoarsphenamin is commended by R. W. Hissem (Jour. Kas. Med. Soc., Jan., 1925). In adults 0.2 to 0.45 Gm. is given intramuscularly at 5 day intervals, and in children, 0.15 to 0.2 Gm. into the veins of the neck or intramuscularly. Excellent results were obtained in the majority of 50 cases of pyuria and pyelitis, usually without any constitutional reaction. The treatment is especially valuable in the toxic type of pyelitis. cases due to cocci (except gonococci) the temperature drop is remarkable, and pain and urinary symptoms soon subside. In bacillary types the urine clears only in several days, after 2 or 3 injections. Elimination of all ureteral kinks, narrowings, stones and pressure, if such are present, is essential before any treatment of pyelitis can be expected to give permanent results.

Hexyl resorcinol, according to V. Leonard (Jour. Amer. Med. Assoc., Dec. 20, 1924), clears up urinary infections due to the usual Gram-positive cocci promptly, completely and permanently. In *B. coli* infections, persistent treatment is usually required. The drug is given by mouth in enteric-coated capsules in doses of 0.33 to 1 Gm. (5 to 15 grains) 3 times daily.

F. A. Gill (Med. Jour. of Austral., Jan. 12, 1924) states that in cases that fail to respond in 3 months to ordinary treatment, renal lavage with colloidal silver solutions affords a rapid, safe and practically certain cure for a condition formerly considered incurable. Four or 5 treatments usually suffice. Local anesthesia with 10 per cent. cocaine solution with

adrenalin is required usually only by the beginner. The rectum should be The bladder having been empty. thoroughly irrigated with boric acid solution or 1:4000 mercury oxycyanide, 240 to 300 c.c. (8 to 10 ounces) of which are left in the bladder, and the ureteral catheter having been introduced through the cystoscope until it will go no further, 5 per cent. colloidal silver solution is injected very gently with a 10-c.c. Record syringe. Pain indicates the dangerpoint, and the syringe shows the capacity of the pelvis. Injections are repeated at 3 or 4 day intervals, up to 6 injections.

PYELONEPHRITIS.—This condition, occurring as a complication of pregnancy, has been more often recognized of late, as noted by J. C. Applegate (Ther. Gaz., June, 1924), by reason of more intensive prenatal study, including critical uranalyses. It occurs more frequently in primiparæ, and from 20 to 30 per cent. of the patients develop pyelitis or pyelonephritis in subsequent pregnancies. Treatment in the writer's cases consisted of rest with free use of fluids; a liquid diet consisting largely of milk alkalinized with milk of magnesia; sodium bicarbonate or potassium citrate or both, in alternation with hexamethylenamin, and external heat over the painful area. Careful attention to the bowels, to hinder multiplication of colon bacilli, is imperative. Pelvic lavage with a silver salt is used in refractory cases. Spontaneous abortion or premature delivery did not occur in more than 5 per cent. of the writer's cases, nor in over 5 per cent. was interruption of pregnancy required.

In chronic pyelonephritis, changes in the renal pelvis and calyces and fibrosis of the ureter result, according to H. C. Bumpus, Jr. (Jour. of Urol., May, 1924), in poor renal drainage and retention of exudate and infected urine. To remedy this condition, he inserts 2 indwelling ureteral catheters up the ureter to the renal pelvis. The No. 6 size is best. One catheter is withdrawn 2 or 3 centimeters to insure its being lower in the pelvis than the other. A reservoir containing lavage solution is then connected with the upper catheter and hung several feet above the patient, thus affording a renal lavage which is kept up for several hours each day. The catheters may be left in as long as they drain freely; usually by the 6th day they become occluded with mucus and urinary salts, and are withdrawn. Two others are then placed in the opposite kidney and the treatment This procedure proved continued. successful in the 2 cases in which the writer employed it. The lavage fluid used was 1:10,000 acriflavin in 1 case and 1 per cent, acid fuchsin in the other.

PYLORIC STENOSIS, CONGENITAL.—Recovery took place in 156 and death in 69 of 225 cases of congenital hypertrophy of the pylorus observed by G. F. Still (Brit. Med. Jour., Apr. 7, 1923). Of 78 treated only by lavage, 43 recovered and 35 died. This procedure has had sufficient successes to justify its retention as a method of treatment which may be the best one to adopt in particular cases. In infants that are being breast-fed, prompt operation is usually the wisest course; 48

hours later, the infant can continue the breast milk. Forcible dilatation was performed in 108 cases, with good results in 86 and death in 22. The Rammstedt operation was successful in 18 out of 29 cases. A small group of 6 cases showed that in a few cases the tumor and peristalsis will, in the course of weeks or months, gradually disappear, with complete recovery, merely upon regulation of the feeding, usually by reduction of the food to small quantities at short intervals.

In 7 cases of congenital pyloric stenosis A. Johannessen (Ugeskr. f. Laeger, Feb. 7, 1924) was able to restore permeability of the pylorus with large doses of atropine. The drug was given 1/2 hour before feeding. Its effect began to be evident in a few days and reached its maximum at the 10th to the 14th day. It must be continued for 9 or 10 weeks. The dose given was 2 drops of 0.1 per cent. atropine sulphate solution 4 or 5 times a day, at 1st usually preceded by lavage of the stomach. largest daily dose tried was 0.007 Gm. (765 grain). In 1 case there were marked toxic symptoms requiring suspension and later resumption in smaller dosage. In 4, discontinnance of the drug was followed by return of vomiting, but the latter passed off again under brief resumption of the treatment.

According to J. W. Bruce (South. Med. Jour., Dec., 1923), atropine in large doses and thick cereal feedings are more effective when used in combination than when either is used alone. He finds the following formula very satisfactory: Whole milk, 1 pint; farina, 4 level tablespoonfuls; sugar, 1 level tablespoonful. This is

cooked until it sticks to an inverted spoon; 2 hours in a double boiler suffice. The infant is given 1 to 3 tablespoonfuls of this cereal every 4 hours, most conveniently by cutting a large hole in a hygeia-nipple, filling the rubber cup of the nipple with the cereal, and poking it through the hole with a clean finger. The writer considers operation rarely necessary, specifying the following indications: (1) When it is impossible to get good nursing care for the necessary 1 or 2 months; (2) when there is no gain on medical treatment in 3 weeks; (3) when fluids are vomited and have to be given artificially for more than a week. For artificial administration of fluids, the nasal drip is best.

F. J. Poynton, J. T. Higgins and J. M. Brydson (Lancet, Feb. 2, 1924), on the other hand, advise Rammstedt's operation as soon as the diagnosis has been made. Of 20 cases thus dealt with, 16 recovered. Similarly, E. D. Smith (China Med. Jour., June, 1924) advocates prompt operation when the infant shows a propressive decline in weight. If, however, the patient is already practically moribund when the condition is recognized, thick cereal feedings and atropine may improve the general condition sufficiently to permit operation. Upon induction of anesthesia, the writer passes a flexible catheter, about 20 Fr., into the stomach, thus obtaining expulsion of the opaque meal, if such has been used; this removes the objection to fluoroscopy in these cases. After the stenosis has been split, any uncertainty as to whether the pylorus has been rendered patent is dispelled by grasping the catheter through the stomach wall and passing its tip into the duodenum. After the operation, carefully graduated feeding and alkalinization by colonic irrigations are indicated.

> Diathermy is stated to have had a remarkable and almost immediate effect on the vomiting and other symptoms in 2 cases of pylorospasm seen by W. Tobler (Zeit. f. Kind., May 12, 1924).

## PYORRHEA ALVEOLARIS.—

According to I. L. Folstein (Dent. Cosm., Feb., 1925), quartz light therapy (ultra-violet rays) is the only method which, in his hands, has given consistent therapeutic results. The 1st effect is eradication of pus, generally seen after 2 or 3 exposures. Then follow a steady diminution and subsidence of puffiness of the gum, which becomes pink and firm; gradual closure of the pockets; tightening of the loose teeth, and arrest of recession of the gum margin. X-ray is asserted to show the development of new and healthy peridental membranes around the teeth under radiation. Preparation for the treatment consists in removal of bridges shown by X-ray to be impinging on soft tissues, or improperly placed fillings, and of thorough scaling of deposits around the necks of the teeth. The ultraviolet applicator is held against the tissues with gentle pressure. At the 1st treatment it is held in position for 1 minute only at each area treated. Not more than 3 or 4 teeth are treated at 1 time, and each area is treated both facially and lingually. At subsequent sittings, at 2-day intervals, the exposures are prolonged by 1 minute each time, until a burn or blister formation is seen or there is marked improvement. A week's interval is then allowed, after which the same duration of application is repeated. The patient does not blister again, and the time can again be progressively increased, until finally a cure has been effected. Temporary tingling or burning, an erythema and an ultimate tanning result from the treatment. No lasting local or systemic

injuries can result, even from excessive exposures. In the later treatments the intervals are increased to 3 days, or 2 sittings weekly.

F. A. Gillett (Jour. of Radiol., June, 1924) likewise found the actinic rays from the water-cooled lamp useful to relieve soreness and tighten the teeth, though in most cases surgical treatment had already been given.

Q

OUINIDINE .- To elucidate the mode of action of quinidine on the heart, J. A. Waddell and M. Cohen (Jour. of Lab. and Clin. Med., Sept., 1924) tested its effects on turtle and frog hearts by various methods. The effects were found to be qualitatively the same on the auricle and ventricle. The rate is slowed; the amplitude of the excursions is increased, except with massive doses. Diastolic tone and myocardial irritability and elasticity are decreased. The refractory phase and the latent period on electric stimulation are lengthened. Conduction is constantly disturbed. The drug seems to be a physiologic depressant, analogous to ether on the brain and cocaine on the nerves, and acting on the musculature of the heart, including that of the conducting system. Its effects disappear quickly after withdrawal, and with moderate dosage there is no permanent tissue damage.

From the clinical side, the most extensive recent report on quinidine is that of J. Hay (Lancet, Sept. 13, 1924), based on replies to a questionnaire sent to the members of the Cardiac Club of Edinburgh. The method of administration varied considerably, but in the most successful cases the total amount required was usually not large, 1 to 3 Gm. (15 to 45 grains) frequently sufficing. The general opinion favored continuing the drug for some time after restoration of normal rhythm. The cases were placed in 3 groups: (1) Auricular fibrillation with valvular disease, 166 cases: Permanent successes, 46; temporary successes (ultimately failures), 42; complete failures, 78.

Auricular fibrillation without valvular discase, 87 cases: Permanent successes, 35; temporary successes, 24; complete failures, 28. (3) Thyrotoxic cases and Graves's discase, 12 cases: Permanent successes, 8; temporary success, 1; complete failures, 3.

The replies showed an increasing tendency to use the drug only in carefully selected cases. It is most likely to be of service when auricular fibrillation is of recent development, with but little cardiac enlargement and no valvular disease; when its onset has been associated with some acute infection, such as influenza, or when distress dates definitely from the onset of fibrillation. There is marked unanimity as to the value of quinidine in fibrillation associated with exophthalmic goiter, especially where it has persisted after partial thyroid-ectomy.

Minor toxic effects were reported as not infrequent, comprising headache, nausea and vomiting, diarrhea, abdominal pain, faintness, general distress, dizziness, tinnitus, a sense of apprehension, palpitation, precordial pain, excessive ventricular rate, orthopnea, sweating, erythema and urticaria. Idiosyncrasy may be pronounced, but is discovered with a tentative dose. Eight patients died suddenly, embolism occurring in 7 of these. Three had cerebral embolism, and 3, embolism in arteries of the leg or arm. Symptoms of ventricular stoppage, with Adams-Stokes syndrome, were noted in 2 cases of mitral stenosis.

Unsuitable for quinidine are cases with: (1) Badly damaged hearts, long-standing valvular disease and undoubted failure of compensation; (2) history of angina pectoris, with the onset of fibrillation followed by cessation of pain; (3) idiosyncrasy; (4) acute or subacute infective endocarditis; (5) a history of embolism.

As suggested by the report, the tendency of late has been to give full recognition to the sources of risk, more or less serious, attending the use of quinidine, and to exclude it from the list of drugs which, like digitalis, may, within reasonable limits, be used even in the absence of direct indications with little likelihood of serious harm. Plum (Ugeskr. f. Laeger, May 17, 1923) has reported a death from cerebral embolism in a woman aged 34 with chronic mitral disease and auricular fibrillation, after 1.2 Gm. (19 grains) of quinidine sulphate had been injected in the course of 2

days. Such cases are accounted for by the dislodging of thrombi formed in the dilated fibrillating auricles, when normal auricular activity is resumed under the quinidine. R. A. Bullrich (Sem. méd., Oct. 16, 1924) reports a case of collapse with reduction of rate from 130 to 55 or 60 after 1.8 Gm. (28 grains) of quinidine had been taken in 4 days. Electrocardiograms suggested a marked prolongation of the refractory phase of the heart-muscle by the drug, no disturbance of conduction being detected. J. G. Carr and W. H. Spoeneman (Ill. Med. Jour., Dec., 1924) report untoward manifestations in 27 out of 83 patients treated, including instances of embolism and sudden collapse.

[See also ARRHYTHMIAS.]

## R

RABIES.—SYMPTOMS.—From observation of cases of rabies in Egypt, R. V. Dolbey and A. El Katib (Lancet, Mar. 15, 1924) state that the 1st symptom is a rise of temperature; therefore, in the hospitals, the temperature charts of dog-bite cases are carefully watched even after the wound has healed. The next symptom is insomnia, and this is followed in about 3 days by the so-called pharyngeal spasm. The latter is actually a spasm of the diaphragm, and is best compared to the long, shuddering inspiratory clonic spasm which occurs when a child is immersed in cold water. Before this pathognomonic spasm appears, however, there is a curious and characteristic mental state of uniform and unmistakable terror. Death occurs usually 48 hours after the appearance of spasm, and is due to a generalized neuritis and paralysis of the higher centers. In children the symptoms are sometimes atypical, no spasm developing at all and the patient being able to drink in comfort to the end. While a diagnosis of hydrophobia can be made almost certainly from the clinical symptoms, the only absolute proof is inoculation of filtered human saliva into the brain of a rabbit; in the latter, furthermore, rabies must not be confused with a simple infective meningitis.

PROPHYLAXIS.—As described by the preceding writers, the treatment of a bite is, 1st, by cautery, excision or caustics; then, until the animal is definitely proved to be nonrabid, by emulsions of dried cords of rabbits injected daily for 21 injections (Pasteur treatment). If the bite is severely lacerated or a definite wolfbite, or situated on the face, the treatment is given by serum as well as by glycerin emulsion.

Remlinger (Bull. de l'Acad. de méd., Feb. 5, 1924) advocates, chiefly for economic and social reasons, a reduction of the period of prophylactic

treatment from 15 to 5 days, with injection of the cord emulsion, not once, but 2 or 3 times a day, according to the gravity of the case. I. Viala (Ann. de l'Inst. Pasteur, July, 1924) reports that all of the 1481 subjects inoculated preventively in Paris in 2 recent years proved to have been successfully protected. Leccisotti (Policlin., Nov. 19, 1923) reports that in the years 1920-1921, in which Puntoni's method of injecting phenolized vaccine of increasing virulence was employed in Rome, the mortality from actual failures of the method in 1347 patients was reduced to zero. W. F. Harvey and H. W. Acton (Ind. Jour. of Med. Res., Apr., 1923) similarly state that in man they had as good results with phenolized vaccine as with the dried cord treatment.

A case of death from rabies 3 years and a few days after the bite of a rabid dog, in spite of prompt prophylactic injections, is reported by Dumitresco-Mante (Bull. Soc. méd. des hôp. de Paris, Apr. 13, 1923).

According to G. II. Bigelow and W. G. Webber (Boston Med. and Surg. Jour., Sept. 25, 1924), the number of reported rabid animals in Massachusetts has increased 1000 per cent. in 8 years. The stray dog is responsible for the spread. Every community should be active in disposing of unlicensed dogs. Zone quarantine when an outbreak of rabies occurs is advocated, all dogs except those immunized against rabies being kept at home or taken out only on leash for 90 days. Muzzling is not generally approved, since the muzzles seldom fit and place the muzzled, licensed dog at a disadvantage when attacked by a rabid dog which is usually a stray and therefore unmuzzled.

Pasteur's suggestion of immunizing dogs against rabies has been carried out on a large scale in Japan, with excellent results. S. Hata (Jour. of Immunol., May, 1924) reports 104,629 inoculations in dogs in Tokio, Yokohama and their environs, with the result that only 41 of these developed rabies, as against 1699 cases in uninoculated dogs, although the latter constituted but ½ of the whole number of dogs in the districts.

TREATMENT. — Curative treatment in developed rabies is, as is well-known, non-existent. In Egypt, according to Dolbey and El Katib (loc. cit.), the symptoms are treated with scopolamine and morphine, and when their violence is controlled, intravenous injection of neoarsphenamin or tartar emetic is resorted to.

RACHITIS.—ETIOLOGY.— As emphasized by the researches of W. J. Orr, L. E. Holt, Jr., L. Wilkins and F. II. Boone (Amer. Jour. Dis. of Childr., Oct., 1923), infants with active rickets fail to retain calcium and phosphorus, even if an adequate amount is present in the diet. They regard defective absorption from the intestine as the cause of the low concentrations of calcium and phosphorus in the serum and the ultimate cause of the defective bone calcification.

J. II. Hess (*Ibid.*, September, 1923) states that in moderate rickets the phosphorus or calcium, or both, may be moderately lowered. In severe rickets, the phosphorus is markedly reduced, even in children exclusively breast-fed, while the calcium may or may not be lowered. Severe rickets was present in about 40 per cent. of the cases of tetany studied. In rickets complicated by tetany the calcium is considerably reduced, while the phosphorus may or may not be reduced.

From their investigations E. Gorter and J. C. Streng (Ned. Maand. v. Gen., xii, 145, 1924) conclude that rickets is due to lack of phosphates, either from deficient supply in the food or excessive losses from the organism. The fat-soluble vitamin in the food probably regulates the phosphorus metabolism, and its action is weak in the dark, the vitamin requiring sunlight or ultra-violet light to exert its maximal action. The vitamin with these peculiar properties deserves a place apart, as vitamin D.

**DIAGNOSIS.**—The recent X-ray and metabolic studies of rickets are being taken into account in its diagnosis. According to a study in 68 cases by L. R. De Buys and L. von Meyşenbug (Jour. Amer. Med. Assoc., Nov. 15, 1924), blood examination, while not always practicable, is the most reliable procedure for determining the activity of the disease. The arithmetic product of the inorganic phosphate and the calcium in the plasma furnishes an important diagnostic index. The normal concentration of phosphate is 5 mgm. per cent. and of calcium, 10 mgm. If the phosphate falls to, say, 2.5 mgm. and the calcium remains at 10 mgm., the product will be 25. According to Howland, a product below 30 always means active rickets. Positive X-ray evidence is of decided value in the diagnosis. Of the clinical manifestations, epiphyseal enlargement is the most dependable, and next to it, costal beading. Craniotabes appears often in cases with normal blood and X-ray findings, and is unreliable if considered alone. Moreover, it is not dependable because of its appearance, as a rule, at an early age and because of its short duration. Cranial bosses, flaring ribs and bowed legs are later changes resulting from rickets, The blood analysis shows no changes indicative of rickets in the 1st 12 weeks of life; from the 12th to the 20th week, the blood changes are more pronounced, and after this there is a gradual return to normal. A seasonal variation of blood phosphate was noted, the lowest average occurring in March.

According to L. H. Barenberg and M. W. Bloomberg (Amer. Jour. Dis. of Childr., Dec., 1924), who studied 129 infants with craniotabes, this symptom before the age of 4 months is generally not due to rickets, whereas after this age it is associated with rickets in at least 75 per cent. of cases. Of 14 infants who developed bow-legs, 14 were not rachitic according to laboratory and clinical criteria. While craniotabes usually responds to antirachitic treatment, bowing does not yield readily to the same measures. There seems to be no distinction between rachitic and non-rachitic forms of this deformity.

TREATMENT.—As stated by J. Garland (Boston Med. and Surg. Jour., Mar. 26, 1925), neither woman's milk nor cow's milk will protect the growing infant from rickets. ultra-violet lamp, the direct rays of the sun, codliver oil and egg yolk will protect. Some one of these agents should be employed daily, at least after the 1st month of life. A codliver oil of known value should be used. Three drams (12 c.c.) a day is not a large dose for a young infant, and in premature cases this may be supplemented with calcium and phosphorus. In cases with tetany, calcium chloride or hydrochloric acid should always be added for the immediate relief of symptoms, but the real cure must come from continued antirachitic treatment. Little fear need be felt as to the digestion of the added fat of the oil; if it seems poorly borne, egg yolk may be substituted.

Orr et al. (loc. cit.) found that ultraviolet radiation causes large amounts of calcium and phosphorus to be retained in the body. Increased amounts are found in the urine, indicating an increased absorption from the intestine. A connecting link between the similar actions of codliver oil and ultra-violet radiation in rickets was seen in the demonstration by Kugelmass and McQuarrie (Science, Sept. 19, 1924) that the chemical substances curative of rickets-codliver oil, egg yolk, etc.-when oxidized, produce a definite blackening of photographic plates screened by quartz (the latter excluding the confusing effect of reducing vapors), while substances non-curative of rickets do not (with the exception that an effect indicating radiant energy was secured with blood). These phenomena are deemed undoubtedly due to the emission of ultra-violet radiation. Oxidation seems an important factor in the production of ultra-violet rays. A. F. Hess and M. Weinstock (Jour. Amer. Med. Assoc., Dec. 6, 1924) find that cottonseed oil and linseed oil, but not liquid petrolatum, take on antirachitic properties when subjected to ultra-violet irradiation.

Lesné and De Gennes (Paris méd., Dec. 20, 1924) deem the ultra-violet rays the most effective treatment of rickets in early childhood, although a suitable diet and general hygiene should be added. The distance from the source of the rays to the child's naked body is 80 cm. (32 inches), gradually decreased to 60 cm. (24 inches). The exposures last 5 minutes at first, then are gradually increased to 15 minutes. Twelve treatments are given monthly (3 weekly) until cure is obtained. The eyes are protected with a bandage. The

effects on the bones are seen after the 1st treatment, and after 40 treatments the bones are normal under the X-ray. K. Pilling (Deut. med. Woch., Nov. 21, 1924) confirms the observation of György and Gottlieb that eosin given by mouth sensitizes children to the quartz lamp treatment; 0.1 Gm. (1½ grains) of eosin is given in 10 c.c. (2½ drams) of water with the food on the day before each treatment. The total exposure required could thus be reduced from 245 to 100 minutes.

Egg yolk was found by A. F. Hess (Jour. Amer. Med. Assoc., July 7, 1923) to have marked antirachitic properties—a feature which proved of value in connection with the tendency of bottle-fed infants to develop rickets during the winter. The procedure consists in adding the yolk of 1 raw egg to the regular feeding formulas. Egg yolk also has curative value, but less than codliver oil.

György and Vollmer (Mon. f. Kind., Aug., 1924) find that endocrin products that accelerate metabolism have a favorable effect on the metabolic disturbance of rickets. They gave alternate subcutaneous injections of thymoglandol and ovoglandol in doses of 1 c.c. (16 minims) and of pituglandol in doses of 0.7 c.c. (11 minims) every other day, generally using 6 ampules in a course of treatment. The phosphate content of the blood was increased. Good results were also obtained by Langstein and Vollmer (Zeit. f. Kind., Aug. 30, 1924) with inunctions of endocrin products. One gram of pituglandol, ovoglandol, thymoglandol or adrenalin was made into an ointment with 0.02 Gm. (1/3 grain) of salicylic acid and 1 Gm. of eucerin. These ointments were rubbed in until they disappeared, *i.e.*, for 10 or 15 minutes. The hormones were absorbed and exerted a marked effect on metabolism. The several products were used in alternation every day or every other day. The favorable clinical effects in 14 cases of rickets, some severe, were confirmed by the blood examinations and X-ray inspection of the epiphyseal changes. The blood phosphorus rose to normal and acid and ammonia excretion in the urine decreased.

Old rachitic deformities in children are treated by C. R. H. Rabl (Münch. med. Woch., Apr. 11, 1924) without operation by temporarily softening the bones by induction of an acidosis, bending them to the proper shape, and applying a cast. The child is given daily 0.15 to 0.25 Gm. (2½ to 4 grains) of ammonium chloride per kilo. of body weight, preferably with 12 parts of sugar, in 20 parts of distilled water. At the same time venous stasis is induced in the affected extremities for about 20 hours daily. The bones elsewhere are probably slightly softened and the child is therefore kept in bed. In 8 to 12 days or somewhat longer the deformed bones are so softened that they can be bent by 30 to 40° with but slight force. The cast having been applied, a rehardening process which occupies 4 to 6 weeks is gone through, consisting of the use of the ultraviolet rays, phosphorus, codliver oil, fresh vegetables, fruits and a little calcium lactate. The method is not available in children over 6 years of age nor in adults, and is contraindicated by renal disease. J. Elsner (Zent. f. Chir., Dec. 6, 1924) applied Rabl's method with success in 13 children below 3 years of age; it failed in 2 boys aged 4 and 7. The bones were softened within 12 days. He considers the method a great improvement over the earlier non-operative procedure requiring months of immobilization.

RADIUM.-PHYSIOLOGIC EFFECTS.—Intravenous injection of 100 micrograms of radium element in man was found by J. Rosenbloom (Jour. of Metab. Res., July-Aug., 1923) to cause an increase in the amount of nitrogen excreted in the urine and a marked increase in the total urinary and the neutral sulphur excreted. These effects lasted about 3 days. The increased sulphur excretion is ascribed to an effect of the radium on intracellular oxidation. E. C. Dodds and J. H. D. Webster (Brit. Jour. of Radiol., Apr., 1924) found that radiation of the abdomen and spleen with the X-rays or gamma rays produced definite urinary and blood changes, apparently due to a temporary inhibition of the functions of the liver, pancreas and kidneys. There was a sudden fall in the 24-hour urinary amounts of urea, uric acid, ammonia, titratable acidity, creatinin, total nitrogen, and phosphates, and the volume of urine was also greatly decreased. After 3 days the excretion of these substances rose to about the normal figure. The blood showed a marked decrease of urea, and the feces, an immediate increase of fat, chiefly the neutral fat fraction. A number of cases, treated prophylactically with calcium chloride or sodium bicarbonate before radiation, showed less reaction.

According to J. C. Mottram and A. N. Kingsbury (*Ibid.*, Jan., 1925), radium is capable of interfering with the production of mucus by the intestinal mucosa, an invasion of the mucosa by bacteria resulting. As a further result, the bacteria may appear in the blood and a thrombopenia be manifest.

Destruction of erythrocytes by radium emanation, according to Redfield and Bright (Amer. Jour. of Physiol., July, 1923), is due chiefly to the action of the alpha rays. The processes of hemochromolysis and stromatolysis proceed independently of one another.

According to B. Sokoloff (C. r. Soc. de biol., Nov. 28, 1924), radium reduces absorption through the lipoid membrane of the cells, and the viscosity of the membrane increases. Clinical observations of patients treated with radium for superficial tumors led him to conclude that the breaking down of the cells or "cellular anarchy" is due to changes in the lipoid membrane.

THERAPEUTICS.—Advances in radium therapy in the last few years have been associated mainly with the use of radium emanation, apart from radium itself. As noted by H. Flecker (Med. Jour. of Austral., June 21, 1924), radium emanation is a gas which is constantly formed from radium, or its compounds, at a fixed rate. Both radium and the emanation owe their therapeutic activity to the presence of beta and gamma rays, and their effects are identical. The life of the emanation is about 5 days. Its activity is easily measured with the electroscope, and is expressed in millicuries; generally 1 millicurie is required to irradiate 1 cu. cm. of tissue. Advantages of the emanation over radium are that receptacles can be made of any shape or form required; that any specially desired dose can be prepared, even minute doses in scattered seeds: that compressibility into smaller bulk is afforded, c.g., for treatment of the larynx; that the bare tubes do not have to be removed when implanted, owing to the rapid decay of the emanation, and that the emanation tubes are of relatively small cost.

Regarding the reasons determining the choice between radium and the X-ray in the individual case, W. S. Lawrence (Urol, and Cut. Rev., May, 1924) asserts that any small surface lesion may be treated by either radium or soft X-rays, unfiltered, with equal prospect of success. Malignancy within a body cavity so situated that a radium capsule may be placed against it, and at the same time be kept at a safe distance from normal tissue; or any such lesion that can be thoroughly transfixed by radium needles, should be treated by radium. Cavity cases that have become extensive with glandular involvement should receive radium within and also high-voltage X-rays by crossfire from without. In quite early cases of cancer of the cervix, the application of sufficient radium within the cervix may bring about a permanent cure.

Cancer of the lower lip can probably be treated better with the X-ray.

According to C. D. Collins (Jour. of Ophth., Otol. and Laryng., Dec., 1924) good or bad results with radium depend entirely upon skill in having all standards (amount, screening, time, distance and repetition) correct, with a correct estimate of the pathologic condition to be treated. Radium gives excellent results in lens opacities with threatened cataract, in epithelial degeneration of the lids or eyeball, and in pterygium. It is readily used about the nose, internally or externally, for various growths, with signal success. In epithelioma about the face, nose, eyes and lips and in smokers' cancer it is by far the best treatment, especially in view of its cosmetic effects. In extensive lesions it should be combined with thermocoagulation. The effect upon hemangiomas is distinctive and beneficial. While radium alone has its definite field of action, best results are often dependent upon a full knowledge of radium, electrocoagulation and surgery.

W. L. Clark, J. D. Morgan and E. J. Asnis (Amer. Jour. of Roentgenol., Dec., 1924) call attention to the following objections to the use of radium emanation in capillary tubes: (1) Irrational in that hard foreign bodies are scattered in the tissues, while cancer is ascribed to irritation; (2) almost impossible to plant at equal distances; (3) glass wall not thick enough to filter out enough of the beta rays, sloughing, great pain and heavy fibrosis resulting; (4) loss of control over the tubes when once planted; (5) devitalizing effect on bone; (6) pain almost always severe and persistent. They cite a case of fatal slough into the subclavian artery and 1 of slough through the cheek in tongue cancer treated with buried emanation tubes. The use of radium or emanation in metal alloy needles overcomes almost wholly the above disadvantages of the bare tubes.

RAYNAUD'S DISEASE.—An instance of 3 cases of this disorder in 1 family is reported by A. Hand and J. J. Reilly (Atlantic Med. Jour., Aug., 1923). The patients were aged  $2\frac{1}{2}$ , 5 and 8 years. Both patients had positive Wassermann reactions, but,

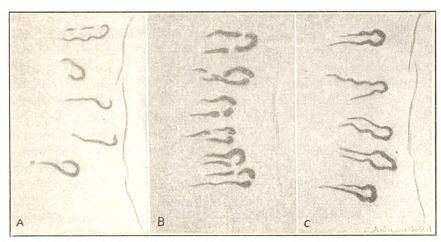
Raynaud's Disease

with the exception of snuffles in 1 case during infancy, none of the 3 children showed evidences of syphilis. Nobécourt (Prog. méd., Mar. 15, 1924) notes that in Raynaud's disease antisyphilitic treatment frequently proves valuable. Other measures indicated are warm hydrotherapy and electric currents.

A case with symptoms of Raynaud's disease due to *cervical rib* is reported by L. Benedek (Deut. Zeit. f. Nerv., Sept., 1924). The patient had attacks

though the attacks of local pallor were less frequent, resection of the right cervical rib was performed. The upper sharp border of the 1st rib and a tubercle on this rib were also removed. As a result, the discomfort was reduced to occasional paresthesias and scapular pains. Considerable improvement in the ankylosis of the finger joints was noted.

According to a study of the skin capillaries in 8 cases of Raynaud's disease by G. E. Brown (Arch. of



Raynaud's disease. Capillaries in the 3 color stages: A, white or syncope stage, partially-filled, contracted capillaries with absence of arterial limb in several loops; B, blue or cyanotic stage, stasis, dilatation and plasma gaps; C, red or rubor stage, sharp, well-defined capillaries indicating partial restoration of tone and flow. (Brown, in Arch. of Int. Med.)

of ischemia with exacerbations of a constant mild pain in the upper limb or hand. There was constant local asphyxia at the nail beds, with necrotic tissues at the fingertips and ankylosis of the joints of the fingers. Leriche's periarterial sympathectomy was performed, the brachial artery being found pulseless, with its adventitia thickened and a thrombus palpable within. At this time X-ray examination showed bilateral cervical ribs. As the intensity of pain remained the same after the operation,

Int. Med., Jan., 1925), of the Mayo Clinic, the phenomena exhibited in this type of vasomotor neuroses indicate an abnormal sensitivity to certain stimuli, and incoördination on the part of the various components of the vascular field. In the normal, compensated periods, many of the capillaries exhibit disturbed tone, abnormal flow or complete stasis. Fairly constantly at room temperature there are many wide, dilated atonic types of capillary loops. In the stage of syncope (white stage), there are many

empty or partially filled contracted loops with stasis; there is excessive contraction of all 3 vascular elements in the skin (arterioles, capillaries and venules), through undue response of the vessels or the vasomotor nerves, usually, to cold, more rarely, to psychic or other stimuli. In the stage of asphyxia there is revealed a loss of coördination between the capillaries and the arterioles. There is seen a gradual refilling of the capillary loops from the arterioles or venules, or both; meanwhile, the capillaries lose their tone and dilate, with stasis of varying duration—a few seconds to 20 minutes-the duration determining the degree of cyanosis. The numbness, tingling and burning seem directly analogous to those in the claudication states resulting from a tissue anoxemia. In the stage of hyperemia (rubor) there is resumption of capillary flow, with many moderately dilated loops and the presence of oxyhemoglobin. There is relaxation of arterial spasm and partial restoration of capillary tone.

Under capillaroscopic control, E. Jürgensen (Deut. Arch. f. klin. Med., May, 1924) treated a case of Raynaud's disease successfully with Bier's passive hyperemia combined with the application of weak stimuli. band on the arm not only closes down the vessels but also gives rise to a vasomotor pressure stimulus. treatment induced visible acceleration of flow in the capillaries, with hyperemia, sensations of warmth, and subsidence of pain for hours, enabling the patients to sleep. Application of a band to but 1 arm did not prevent relief on the opposite side, showing that the pressure stimulus was transferred.

RECKLINGHAUSEN'S DIS-EASE. -A study of the endocrin phases of neurofibromatosis in 9 patients is presented by B. R. Tucker (Arch. of Neurol. and Psych., Mar., 1924). There seemed to be a definite relationship with certain endocrin disorders, the pituitary being most frequently involved, with acromegaloid manifestations in 3 cases and definite evidence of pituitary underactivity in 1 case. The adrenals were involved in a few cases, and all but 1 case had excessive pigmentation; the blood-pressure was low in all but 2 cases, and axillary, torsal and pubic hair was absent or scanty in 4 cases. Two cases in males showed a feminine type of pubic hair distribution, but the sex glands showed no certain relationship to the disease. Necropsy in 1 case showed degeneration of the adrenal cortex and undeveloped ovaries. There was no evidence in these cases of pineal, thyroid, parathyroid or pancreatic involvement. In 1 case an increase of thymus tis-Hereditary and sue was found. familial tendencies may or may not be present. The disease is much more common than is ordinarily supposed.

RECTUM.—The rectum is emphasized by W. A. Fansler (Minn. Med., Feb., 1924) as a factor in chronic focal infection. The common types of infection, occurring singly or in combination, are a general proctitis, infected hemorrhoids, ulceration, cryptitis, and sinuses. At the lower end of the crypts is a blind pocket which may extend beneath the anal mucosa and act as an incubator for bacteria. This is the commonest cause of sinuses leading off from the rectum outward

and downward or at right angles. There is some abscess formation, which enlarges slowly, breaks into the bowel, then gives no more symptoms until the cycle is repeated. If drainage is retarded, soreness and tenderness return. The sinuses are best explored by bent probes after dilatation of the lower end of the rectum and exposure of the crypts of Morgagni. Illustrative cases are given of bronchitis and lumbago cured by eradication of infected rectal sinuses.

CANCER.—In 110 cases of carcinoma of the rectum or rectosigmoid reviewed by F. C. Yeomans (Med. Jour. and Rec., May 21, 1924), the onset was gradual in 77 and sudden in 33. The 1st symptom was constipation in 68, bleeding or cancer diarrhea in 37, and pain in 5. An unaccountable attack of obstinate constipation; a desire to go to stool in the morning on arising, with no result or only the passage of flatus and a little mucus, probably bloodstreaked; an abnormal rectal discharge, and a vague, ill-defined feeling that something is radically wrong in the lower abdomen, or a feeling of obstruction in the rectum, form a symptom-complex that is present in nearly every case of beginning cancer. In this series the tumor was palpable in 99 cases, so that in only 10 per cent. of cases was the proctoscope essential to determine the presence of a growth at a higher level. The ratio of operable cases was 61 per cent. In the treatment, present surgical opinion is veering toward a permanent colostomy, to be followed at once or later by extirpation of the entire bowel distal to the colostomy and a complete dissection of the pelvis. No single type of operation is suitable for every case. The ideal procedure is a 1-stage abdominoperineal extirpation, an enteroanastomosis being performed by the Balfour or other method, or the sigmoid drawn through the anus and fixed there.

H. Küttner (Zent. f. Chir., May 24, 1924), however, takes exception to the view that a permanent abdominal artificial anus must be established as a routine measure and the entire sphincter apparatus always sacrificed. Reporting on 800 cases of the conservative sacral operation, he states there were 36 per cent. of cures extending over 3 years or more, and 24 per cent. extending over 5 years; 52.9 per cent. of these patients secured complete and 17.6 per cent. almost complete continence.

H. A. Kelly and J. E. Ward (Surg., Gyn. and Obst., Nov., 1923) maintain that radium used alone or with some operative procedure is the most valuable therapeutic agent in rectal cancer in all its stages. In a group of 94 cases, 90 of which were inoperable, radium treatment without operation cured 8.5 per cent. of cases and afforded improvement for 6 months to over 2 years in 65.9 per cent. Of 58 cases treated by radium plus operation, comprising 33 cases recurrent after operation elsewhere, 16 cases of extensive involvement and 5 cases apparently hopeless, 17.5 per cent. were cured and 50.5 per cent. improved. In hopeless cases radium is valuable in giving relief to various symptoms and affording comfort for the remainder of life. A number of cases (27 per cent.) do not respond to radium, i.e., are "not radio-sensitive." Trial of radium is, however, justified in every case. In operable cases there is little choice as to

whether radiation or operation should be done first. In inoperable or borderline cases both external and internal radiation, with radium implantation, are advised in the hope of bringing the tumor to an operable size or causing it to disappear.

PROLAPSE.—Postural treatment of rectal prolapse in children has been found effective by P. Widowitz (Münch, med. Woch., Mar. 30, 1923). The prolapse having been replaced and dressings applied, the child is kept continuously in the prone position, and in 2 or 3 weeks the prolapse is definitely overcome. The younger the child, the more it likes the ventral posture, which is more natural for infants than the usual supine position.

In prolapse cases among undernourished Russian children, II. Schotter and M. Lenebach (Münch. med. Woch., Sept. 26, 1924) employed milk injections into the sphincter, with excellent results, the prolapse disappearing in 1 to 6 days. The amount was 4 to 8 c.c. (1 to 2 drams), injected circularly through the anus to a distance of about 3 centimeters (1½ inches). This was repeated, if required, 6 or 7 days later. The effect on the sphincter is ascribed to hyperemia, stimulation and improvement of local tone.

A new operative procedure for rectal prolapse has been described by H. Finsterer (Arch. f. klin. Chir., exxiii, 124, 1923). It is based on consideration of every prolapse as a hernia, the sac of which is formed by the prolapsed peritoneum of the pouch of Douglas, the anus being the hernial orifice. Through a parasacral incision, the ischiorectal fossa is exposed, the rectum freed, the peritoneum opened on its anterior aspect, the loops of small intestine replaced, and the hernial sac removed to the level of the uterine cervix or bladder. Inter-

rupted silk sutures are placed which, at the highest possible level, include the peritoneum and the bladder or uterine wall on 1 side, and the peritoneum and the wall of the flexure on the other. Three centimeters lower another suture is placed, and at the edge of the peritoneum, a 3d. The pouch of Douglas is thus closed off and the pelvic colon fastened as far as the promontory to the posterior wall of the bladder or uterus. To prevent recurrence, muscle flaps are then formed on both sides from the gluteus maximus muscle, fixed to the lateral and anterior surfaces of the rectum, and sutured behind the rectum at the level of the sphincter. Drainage is established through the defects resulting from removal of the muscle flaps, and finally a circular suture of thick catgut is placed subcutaneously above the anus. Morphine is given for 5 days.

ULCER.—Five cases of bleeding rectal ulcer following influenza were diagnosed by proctoscopy by Zweig (Wien. klin. Woch., Apr. 26, 1923). Enemas of gelatin or olive oil containing an antiseptic were used in the treatment. Protein therapy was employed with success by L. von Friedrich (Med. Klin., Nov. 30, 1924) in 3 cases of rectal ulcers, a marked focal reaction incidentally taking place.

RELAPSING FEVER.—The need of careful differentiation of possible cases of relapsing fever from among cases of malaria is stressed by C. A. Amaya (Rep. de med. y cir., xv, 441, 1924), who, in Colombia, found that in about 1/2 of supposedly malarial cases, the spirochetes of relapsing fever were responsible for the condition. Infants and recent arrivals paid heavy tribute to the unrecognized relapsing fever. In children, convulsions are usually the initial symptom. The urgent necessity of properly distinguishing the 2 diseases by blood examination lies in the fact that,

while relapsing fever yields quickly to neoarsphenamin, quinine, vermifuges and decoctions may be actively harmful and lead to a fatal termination.

J. A. Sinton (Indian Jour. of Med. Res., Jan., 1924) describes a method for the cultivation of the parasite of Indian relapsing fever, sufficiently simple for clinical use. To 100 c.c. of human hydrocele fluid or of horse serum is added 1.5 c.c. of 50 per cent. glucose solution. The culture is incubated at 37° C. for 5 days. The organism thus recovered stained well with Giemsa stain and survived at room temperature as long as 6 weeks.

RESUSCITATION. —A number of cases of intracardiac injection of adrenalin have been and are being reported. E. Baumann (Schweiz. med. Woch., Feb. 22, 1923) reported 2 cases of recovery after apparent death in children. The 1st was in a child of 6 years with heart failure under chloroform. Artificial respiration and massage proving useless, 0.75 c.c. (12 minims) of 1:1000 adrenalin solution was injected into the heart, 4 minutes after cessation of breathing and heart-action. The heart began to contract after 7 seconds. After 4 days of high temperature the child recovered. In the 2d case, apparent death followed an attack of suffocation in whooping-cough in a child of 21/2 years. An intracardiac injection of 1 c.c. (16 minims) of 1: 1000 adrenalin was made through the 4th interspace. Strong heart contractions returned in 23 seconds, and after fever for 2 days, the child recovered, the whoopingcough soon after resuming its course. In infants, 0.5 c.c. (8 minims) apparently suffices. In adults, up to 1.5 c.c. (24 minims) may be injected, preferably in the 4th interspace, at the upper border of the 5th rib, about 51/2 cm. (21/5 in.) from the left border of the sternum.

A case of prompt resuscitation in an infant of 6 months, apparently dead under *ethyl chloride and ether* anesthesia, has been recorded by J. Exalto (Ned. Tijd. v. Gen., Mar. 17, 1923). The dose was 0.7 c.c. (11½ minims).

In the case of a *newborn* infant in whom 10 minutes of manipulation to start respiration had been without result and death was believed to have occurred, Newton (Jour. Amer. Med. Assoc., June 2, 1923) injected into the heart 2 minims (0.13 c.c.) of adrenalin, with the result that breathing commenced in 15 seconds and in 5 minutes the child was crying lustily.

According to Harttung (Beitr. z. klin. Chir., cxxix, 423, 1923), intracardiac adrenalin injection is less dangerous than cardiac massage. In 1 of his 2 cases, resuscitation was permanent, while in the other it lasted 6 hours. The amount was 1 c.c. (16 minims), injected into the right ventricle through the 4th interspace, near the sternum. Of 76 recorded cases of cardiac massage after apparent death, the writer found that 35 had been resuscitated, with permanent recovery in 20. Massage from below the diaphragm alone proved effective. He includes death from freezing among the indications for resuscitative measures. The interval since death must not exceed 10 minutes.

In 1 of 2 cases reported by Lenormant, A. Richard and Sénèque (Presse méd., Mar. 15, 1924), the heart-action failed during an operation for uterine fibroids under spinal anesthesia as the table was being inverted for the Trendelenburg posture; 2 c.c. (32 minims) of 1:1000 adrenalin were at once injected into the heart-muscle, with satisfactory results. In the 2d case, however, the resumption of heart-action following adrenalin was only temporary.

Four cases of intracardiac injection are reported by Nicolich and Pototschnig (Rif. med., Nov. 3, 1924). The 1st, in a man of 27, was one of primary heart arrest under chloroform. Three minutes later, 1 c.c. was injected, with pulse returning in a few seconds and respiration in 2 minutes. After fever for that and the next day, recovery took place. The 2d, in a woman of 60, was one of cardiac and respiratory arrest during an operation for malignant thyroid enlargement. Temporary restoration followed 1 c.c. of adrenalin, death occurring in the succeeding night; the autopsy showed myocarditis and arteriosclerosis. In the 3d case, one of general peritonitis from perforated gastric ulcer, adrenalin during the operation prove ineffective. In the 4th

case, one of tuberculous peritonitis, adrenalin was used, not during the operation, but 8 days later, when the heart stopped beating because of *pulmonary embolism*. In this case also it failed. The writers regard the intracardiac injection as a simple, harmless procedure which is always warranted in apparent death.

In the case reported by Woolston and Crain (Jour. Amer. Med. Assoc., Nov. 29, 1924), with apparent cessation of circulation and respiration in a woman of 28, three minutes after an injection for caudal anesthesia, artificial respiration had been used for 18 minutes without effect previous to the intracardiac injection of 1 c.c. of 1:1000 epinephrin. A rapid, bounding pulse followed almost immediately and 2 minutes later breathing was resumed. A convulsion involving the left side occurred soon after, and after being comatose for 2 days the patient gradually recovered, except for some slight nervous symptoms.

Intraäortic injection in resuscitation is preferred to the intracardiac method by Tornai (Med. Klin., June 10, 1923), who has employed the former procedure in 22 cases. With the patient lying horizontally, a fine needle 8 or 10 centimeters (31% or 4 inches) long is introduced in the midline between the sternum and trachea, but closer to the trachea, down to the arch of the aorta. Contact with the vessel being shown by the movements of the needle, the latter is pushed in 0.5 centimeter (1% inch) deeper and the injection of the stimulating drug, such as caffeine, strophanthin or strychnine, carried out.

The procedure is particularly useful in collapse during operations, but is also serviceable in critical periods in such conditions as meningitis, uremia, eclampsia and encephalitis. Moribund cases of cancer or hepatic disease were roused and enabled to survive for 28 hours to 4 days. In 3 cases of apoplexy the writer removed 150 to 200 c.c. of blood from the aorta through the needle before injecting a stimulant.

That the "primary signs of death" are all unreliable is maintained by O. Bruns (Klin. Woch., Dec. 24, 1923), who advocates the application of resuscitative measures in all cases of apparent death until cadaveric rigidity or death spots appear. In restoration of the circulation cardiac massage is

important. The **Sylvester method** is the only procedure of artificial respiration which assists in emptying the heart according to the writer's experiments.

In the suspended animation due to electric currents, S. Jellinek (Wien. klin. Woch., Nov. 22, 1923) lays stress on very early and very protracted application of artificial respiration as being indispensable for good results. In 2 cases of sudden collapse and disappearance of all signs of life due to electric currents, artificial respiration was kept up for 1 and 3 hours, respectively, until finally spontaneous breathing returned. During the artificial respiration great care should be taken to see that the tongue is kept in its normal position, being pulled forward if necessary, since proper respiratory ventilation is coupled with favorable pressure effects on the circulation. Lumbar puncture, with the patient lying on his side, should be carried out to relieve the spinal fluid pressure, which is frequently increased, before any injections of caffeine, adrenalin, etc., are administered.

[See also Artificial Respiration and Gas Poisoning.]

RETINA.—DETACHMENT.—

In this disorder, Sourdille (Bull. de l'Acad. de méd., June 5, 1923), in order to induce an inflammatory reaction which will bring about adhesion between the detached retina and choroid without harming the visual function, makes 2 or 3 small punctures with a slender Graefe knife in the region of the equator of the eve and of the area of the detachment, in such manner as to perforate the detached retina and induce small effusions of vitreous beneath the con-Into these effusions a junctiva. 1:1000 solution of mercury cyanide combined with cocaine or procaine is injected, this solution then diffusing in the eye through the openings previously made with the knife. An-

other procedure he employs in some

cases consists in raising the bulbar

conjunctiva from the eye, making 3 or 4 punctures with a very fine galvanocautery, and then resuturing the conjunctiva. Of 16 cases of recent detachment, 62 per cent. were cured and 6 per cent. improved, and of 18 cases of long-standing detachment 50 per cent. were cured and 22.2 per cent. temporarily improved by these procedures.

RHEUMATISM. See ARTHRITIS.

RHINITIS, ACUTE. See ACUTE RHINITIS.

RHINITIS, ATROPHIC. See OZENA.

RINGWORM.—H. H. Hazen (Jour. Amer. Med. Assoc., Oct. 11, 1924) notes that no less than 9 to 10 per cent. of all his new patients come seeking relief from eczematoid ringworm. The parts most often affected are the interdigital spaces, soles, fingers, palms and backs of the hands; less commonly, the arms, legs, groins and perineum. Air, sunlight, cooling, dryness and lack of irritation are beneficial influences. A clinical diagnosis can frequently be made by examination of the feet; on the backs are usually minute vesicles, and on the soles, frequently dry peeling and some fissures. For microscopic examination, which is important, it is best to snip off the top of a fresh blister, soak it overnight in 10 per cent. KOH solution, and examine 12 hours later. Dry scales on the limbs will usually reveal the presence of the organism (Epidermophyton inguinale).

In the treatment, Whitfield's ointment and mercurochrome-220 soluble in ointment or solution prove of value.

In the interval between the acute outbreaks which usually characterize vesicular tinea of the feet, Glaze (South. Med. Jour., Sept., 1924) removes the epidermis with the following puttylike, clinging paste of strong salicylic acid, much of the offending fungus or mold coming away with the cast-off skin:

ROCKY MOUNTAIN SPOT-TED FEVER.—Noguchi (Jour. of Exp. Med., Mar., 1923) has obtained a strongly active immune serum in rabbits against this disease, and suggests that whenever the bite of a tick gives reason to suspect a possible infection with spotted fever, 0.2 c.c. of the rabbit serum per kilo. of body weight be given immediately, preferably intravenously (for the average adult, about 16 c.c.). The serum shows little effect in the developed disease.

Noguchi (Northw. Med., Sept., 1923) has also worked out a method of prophylactic inoculation with heated serovaccine which promises to supply a partial or complete immunity in human beings.

TREATMENT.—H. P. Greeley (Jour. Amer. Med. Assoc., Nov. 8, 1924) deems intravenous injection of mercurochrome-220 soluble worthy of trial in this disease. In a case in a woman of 28, injection of 20 c.c. (5 drams) of a 1 per cent. solution was followed in an hour by a severe chill and fever. In 12 hours the severe muscular pains and soreness disappeared except in the neck and head, and the disease appeared to be arrested.

SALICYLATES.—ADMINISTRA-TION.—The use of salicylates by rectum, as availed of in hospital wards and in 266 ambulant patients, is discussed by G. R. Irving (Arch. of Ped., Dec., 1923). It is safe to give much larger doses by this route than has been thought. The preparation nearly always used was sodium salicylate, in doses of 20 to 100 grains (1.3 to 6.5 Gm.). A small car irrigating syringe may be used for the injections, with its tip thoroughly lubricated and all air expelled before introduction. Plenty of vaselin is applied about the anus, and the patient placed recumbent. No injection should be attempted until an hour after the last bowel movement. The injection should be retained at least an hour for its absorption; if expulsion occurs within this time the process should be repeated. A few children showed slight toxic reactions. If toxic symptoms appear, the unabsorbed portion can be removed with a simple enema.

SALIVARY FISTULA.—In 4 out of 6 cases of parotid fistula, K. Kleinschmidt (Münch. med. Woch., June 22, 1923) found that the fistula dried up for a couple of weeks following 1 or 2 X-ray exposures, giving the fistula an opportunity to heal. The outlet from the parotid into the mouth must, of course, be permeable if the procedure is to prove successful. In his 2 remaining cases prompt healing did not occur, and excision of the fistula was resorted to.

SALPINGITIS.—In acute salpingitis in which there is a febrile reaction and in which pus in the pelvis demands interference, W. Blair Bell (Brit. Med. Jour., Sept. 8, 1923) does merely a posterior colpotomy. In pure gonococcal infection there is little danger to life, and salpingostomy may be tried at the proper time. L. Phillips (Ibid.) reports 20

reconstructive operations on the tubes, 5 pregnancies later resulting. Three successes were in cases of bilateral salpingostomy for closed, club-ended tubes; 1 in a case of bilateral resection and anastomosis, and 1 in a case of bilateral incision and suture after separation of adhesions with resection of 1 ovary. No successes followed partial salpingectomy or operations performed at the uterine end of the tube.

Intravenous calcium injections in severe acute adnexal inflammations are recommended by Fekete (Mon. f. Geb. u. Gyn., Sept., 1924). Pain and fever generally subside after 5 or 6 injections. The dose was 10 c.c. (2½ drams) of a 10 per cent. solution of calcium chloride, injected on alternate days to a total of 6 to 8 injections. No effect on the inflammatory leukocytosis was observed. In menorrhagia, metrorrhagia and lcukorrhea good results were also obtained.

Gellhorn (Amer. Jour. of Obst. and Gyn., Nov., 1924) finds an important field for protein therapy by milk injections—usually 5 to 10 c.c. every 3 to 5 days—in pelvic infections, particularly if gonorrheal. The tubes, uterus and probably the bladder are favorably influenced, while the ovaries seem refractory. Exudates are brought to absorption, or a circumscribed suppuration is hastened so that surgical attack is rendered possible.

SARCOMA.—While confirming the relatively higher incidence of sarcoma as compared to cancer before the age of 30, Schamoni (Zeit. f. Krebsf., Dec. 15, 1924), from extensive statistics, concludes that sarcoma quite often affects older subjects, especially between 40 and 60.

Summarizing the results of the Roentgenotherapy of sarcomas at the Radium Institute of Paris from 1919 to 1921, Regaud, Roux-Berger, Jolly, Lacassagne, Coutard, Monod and G. Richard (Paris méd., Feb. 2, 1924) find that out of 62 cases treated, 16 were well early in 1923, 6 were alive but had recurrences, and 40 were dead. There were no cures of myeloid or fibroplastic sarcomas. In the absence of a biopsy for pathologic study, the treatment is largely empiric and the prognosis uncertain. Biopsy should be avoided or preceded by X-ray treatment when the growth is not ulcerated.

Whereas surgical treatment is generally ineffective in lymphomas and myelomas, and may be disastrous, wide Roentgen treatments are very efficient, and a local cure is obtained in the majority of cases. Metastases are very frequent, but they had already started at the time of treatment. In advanced cases, the metastases develop more rapidly upon removal of the principal growth, yet may sometimes be successfully treated. In osteogenic or chondrogenic sarcomas the X-ray appears to be the treatment of choice. Radium is seldom indicated in sarcoma, the growths usually being too large for radiumpuncture, which might, furthermore, lead to dissemination of tumor cells. The epulis and myeloplax varieties of sarcoma are the chief indications for radium. In fibroplastic sarcomas, usually resistant to radiation, surgical treatment is that of choice.

According to P. Barbarin (Paris chir., Nov.-Dec., 1923), radium may prolong life considerably in sarcoma, and is superior to deep X-ray treatment. In a case of inoperable *osteosarcoma of the sternum*, radium needles used after

the X-ray had proven inactive led to necrosis and discharge of the tumor mass, leaving a cavity which soon healed; 20 months later there was no recurrence. In an inoperable *iliac sarcoma* treated with buried radium tubes and application of radium in the vagina and iliac region, life was prolonged for about 2 years.

A. K. Owen (Amer. Jour. of Roentgenol., Apr., 1924) reports a case of melanosarcoma of the forearm measuring 4 x 3 centimeters, with 3 metastases, which was successfully treated with the X-ray, no recurrence being present 3 years later. The tumor received a total of 3½ hours of unfiltered rays during a period of 5 months, and the arm, chest and axilla, 13½ hours of filtered rays during 8 months.

SCABIES. -The Danish treatment of scabies is recommended by S. Lomhelt (Jour. Roy. Army Med. Corps, Apr., 1924), who notes that in the last decade the method has displaced almost all other methods in Denmark. The preparation of the ointment used is a little complicated: Sublimed sulphur, 1 kilo., is dissolved at gentle heat in 2 kilos. of 50 per cent. potassium hydroxide solution. Petrolatum and anhydrous wool-fat, 225 Gm. of each, are carefully mixed without heating, and to the mixture are added 375 Gm. of the sulphur and potash solution previously mentioned. Fresh zinc hydroxide is prepared by mixing zinc sulphate, 28 Gm., with 20 per cent. sodium hydroxide solution, 40 Gm., and the washed precipitate added to the ointment. Finally, liquid petrolatum is added to obtain a total weight of 1000 Gm., and also benzaldehyde, 5 Gm., to check the somewhat unpleasant odor of hydrogen sulphide. The high sulphides of potassium are the active agents in the ointment, hydrogen sulphide being produced when the latter is placed on the skin.

In using the ointment, the patient, after an ordinary cleansing bath, rubs his whole body, except his head, with it. Hard rubbing is unnecessary. He waits 15 minutes and then goes to bed. A single inunction suffices; after 24 hours the scabies is cured, and no relapses ever occur. Next day at the same hour he receives a 2d bath and clean clothing.

SCARLET FEVER.—ETIOLOGY.—On account of the proven impracticability of conducting satisfactory researches on the etiology of scarlet fever in animals, students of the subject were eventually led to use human volunteers for this purpose. G. F. and G. H. Dick (Jour. Amer. Med. Assoc., Oct. 6, 1923) obtained from the pus from an infected finger of a nurse with scarlet fever a hemolytic streptococcus which induced typical mild scarlet fever in 2 out of 5 volunteers when swabbed over their tonsils and pharynx.

A. Zingher (N. Y. State Jour. of Med., Nov., 1924) credits the Dicks with having definitely identified the hemolytic streptococcus associated with scarlet fever as the causative agent of the disease. Furthermore, with the separation of a toxin produced by the scarlatinal streptococcus, our conception of scarlet fever and the immunity following it have undergone a change, as the disease must now be considered a local infection of the pharynx with production of a soluble toxin which is absorbed into the system and gives rise to the rash and other constitutional symp-

Scarlatina differs from diphtoms. theria in that the toxin stimulates production of immunity in nearly all patients, and in the tendency of the hemolytic streptococcus to invade the body and produce infections of the ear, glands and joints. The immunity to scarlet fever is, therefore, chiefly antitoxic and not antibacterial, and patients who have recently recovered may develop other infections with the specific scarlatinal organism, these infections, however, not showing the clinical criteria of scarlet fever, such as the rash and desquamation.

The recent studies have demonstrated conclusively, according to F. A. Stevens and A. R. Dochez (Jour. of Exp. Med., Oct., 1924), that a group of hemolytic streptococci possessing specific antigenic and peculiar toxic properties is associated with the angina of scarlet fever. At present the most practical method of identifying this group is the agglutination reaction. From the standpoint of transmission of the infection, the occurrence of these agglutinable strains of streptococci in the throat and in the complications late in convalescence is important. In 87.5 per cent. of 40 patients with acute scarlatinal throats during the 1st week of the disease, the writers found hemolytic streptococci present. In 65 per cent. of the cases a group of streptococci was isolated which agglutinated with scarlatinal immune serum. Strains of hemolytic streptococci belonging to this group were isolated from the throats of patients at the termination of quarantine (30 days). Hemolytic streptococci were found most frequently in the throat in convalescents in whom the tonsillar inflammation had not entirely subsided. From their research the writers believe that the complications in scarlet fever may be due either to the original scarlatinal strain or to a secondary infection with pyogenic strains of streptococci.

In Italy a separate group of investigations on the germ of scarlet fever has been going on for some years, and claims are there made that the organism isolated by Italian observers is the actual virus of the disease. As related by G. Caronia (Riv. di clin. ped., Dec., 1923), in 1921 Di Cristina reported his discovery in the blood and bone-marrow of scarlet fever patients of anaërobic bacteria which grew in serial cultures and, when injected into rabbits, induced a disorder identical with scarlet fever. Later, Caronia and Sindoni repeated Di Cristina's experiments and showed that during the rash and 1st part of the stage of desquamation there were present, in sections of bone marrow, organisms which these observers regarded as identical with that described by Di Cristina. According to M. B. Sindoni (Pediatr., Oct. 15, 1924), this organism can be isolated also from the nasopharyngeal secretions, cerebrospinal fluid, urine and products of desquamation. In some cases with purulent complications, it may be found in pleuritic, otitic or other pus collections. It grows anaërobically on certain media (Di Cristina, Tarozzi-Noguchi or Caronia media). It is rounded when single, ovoid when in pairs, is 0.2 to 0.4 microns long, surrounded by a narrow clear zone, stained by all common anilin stains, and Gram-positive. This organism is filtrable through the finest filters-a fact pointing to an ultramicroscopic phase in its life history.

The susceptibility of *infants* to scarlet fever was tested by R. Pollitzer and S. Raspisardi (*Ibid.*) by means of intracutaneous injections of cultures of Di Cristina's germ in 100 newborn infants and 50 nurslings. In harmony with clinical experience in this connection, the tests revealed susceptibility in only 7 per cent. of the newborn. In the 1st 6 months the percentage of positive reactions rose to 16 and in the 2d 6 months to 40.

DIAGNOSIS.—Referring to the Schultz-Charlton or rash extinction test, W. Mair (Lancet, Dec. 29, 1923) notes that if 1 c.c. of serum from a normal person or from a convalescent from scarlet fever is injected into the skin of a scarlet fever patient, there appears after about 6 hours a complete blanching of the rash over an area from 1/2 inch to a few inches in diameter. According to Mair, this reaction is a toxin-antitoxin phenomenon. His results in using it were good. A mixture of serums from 14 scarlet fever convalescents was tried on 18 different scarlatinal rashes. In 14, there were positive results; only 1 was negative, while 3 could not be read on account of disappearance of the rash as a whole. Serum from a normal adult with a history of scarlet fever in childhood yielded a positive reaction in 7 cases of scarlet fever and a negative one in 1 case. He finds that the reaction to a given serum varies considerably in degree according to the rash on which it is tested.

Dochez (Jour. Amer. Med. Assoc., Feb. 16, 1924) points out that the serum from an animal immunized against the scarlatinal hemolytic streptococcus causes rash extinction just as does the serum from convalescents. F. G. Blake, J. D. Trask, Jr., and J. F. Lynch (Jour. Amer. Med. Assoc., Mar. 1, 1924) tried the extinction test with Dochez's scarlatinal antistreptococcic serum, making 23 tests in 13 cases of scarlet fever, with consistently positive results, while control tests with normal horse serum and polyvalent antistreptococcic serum were negative. The amount of serum injected (intracutaneously) varied from 0.02 to 0.5 c.c. The area of blanching, in consequence, varied from 2 to 6 cm. in diameter. It persisted until the rash had completely faded, and when the injection was made within 24 hours after appearance of the rash, it prevented subsequent desquamation from the corresponding area. A simple intradermal test of probable value in the diagnosis of scarlet fever is thus afforded.

The Dick test (see below) is recognized by Zingher (N. Y. State Jour. of Med., Nov., 1924) as of assistance in the diagnosis of doubtful cases of scarlet fever. This test, applied in 232 cases of scarlet fever, showed 91.3 per cent. of positive reactions during the early stages of the disease and negative reactions during convalescence. It will help in the identification of normal and of persistent convalescent carriers of the specific streptococcus.

## PROPHYLAXIS.—THE DICK TEST AND ACTIVE IMMUNIZATION.

—Through recent outstanding investigations, important procedures in many ways analogous to the Schick test and toxin-antitoxin immunization in diphtheria have been intro-As described by Zingher duced. (Jour. Amer. Med. Assoc., Aug. 9, 1924), the Dick test consists of the intracutaneous injection of 0.1 to 0.2 c.c. of a dilution of the soluble toxic filtrate obtained from a culture of the specific hemolytic streptococcus. The dilution of the toxin for the test varies from 1:500 to 1:2000, according to the strength of the toxin. For greater accuracy in the reading, Zingher recommends a control test with toxin that has been heated (in 1:100 or 1:1000 dilution) in a waterbath at boiling temperature for 1

hour. The grades of response to the test recognized by the writer are as follows: (1) Intense redness and local induration (maximum reaction). (2) Marked redness with slight or no induration. (3) Varying degrees of redness, from moderate red to pink. (4) Small area of faint redness (classed with the negative reactions). In the early stage of scarlet fever, the test showed a positive reaction in each of 141 patients. The reactions rapidly became less marked, and were negative from the 7th to the 10th day of the disease. Of 170 convalescent cases, 158, or 93 per cent., gave a negative Dick reaction. Positive reactions can be brought out in convalescence by using a stronger dilution (1:100).

As noted likewise by Zingher (N. Y. State Jour. of Med., Nov., 1924), the diluted scarlet fever toxin is more stable than the diluted diphtheria toxin used in the Schick test, and can be distributed ready for use. The positive Dick reaction appears more rapidly than the positive Within 8 to 12 hours one Schick. can tell who is susceptible to scarlet fever; at the end of 18 to 24 hours the positive Dick reaction resembles the positive Schick test that has reached its maximum intensity on the 4th day. The Dick reaction, however, also fades rapidly, only the very strongly positive reactions showing a slight brownish pigmentation at the end of 7 to 10 days. Dick and Dick (Ther. Gaz., Dec., 1924) inject an exact dose of 0.1 c.c. skintest solution intradermally on the flexor surface of the forearm. The reaction is observed not less than 22 nor more than 24 hours after the injection.

point of a negative skin test. The response 1st shows a more rapid fading, then becomes entirely negative, usually within a week after the last dose of toxin is given.

For the prevention of scarlet fever by active or passive immunization after definite

Confirmation of the validity of the Dick test has come from various sources, both in the United States and abroad. Zingher (loc. cit.) deems it a reliable method for determining susceptibility and immunity to scarlet fever. In his experience with the test in over 7700 subjects, the percentage of positive reactors-29.2-was about the same as has been found for the Schick test. This applied to public schools and institutions. Of 320 children attending private schools for the well-to-do class, 83 per cent. were susceptible-which is again comparable to conditions relating to diphtheria. Of the more than 7700 subjects tested, none of the negative reactors have since developed scarlet fever, while 8 of the positive reactors have done so.

For the prevention of scarlet fever by active or passive immunization after definite exposure, the skin test is made as soon as possible. At the same time, a throat culture is made on blood agar plates. If the skin test is negative, nothing more is done. If positive, the next step depends on the culture. If the plates show no hemolytic streptococci, active immunization is carried out with 3 doses of toxin. If they show hemolytic streptococci, passive immunization is carried out by injections of convalescent scarlet fever serum. (Of 52 persons with positive skin tests 52 were immunized with toxin and 10 with serum).

Active Immunization.—Dick and Dick (Jour. Amer. Med. Assoc., July 12, 1924) found that injections of their scarlatinal toxin in susceptible persons caused a reaction consisting of malaise, nausea, vomiting, fever, and a scarlatinal rash, disappearing in 48 hours, and that following this reaction the skin test [Dick test] became negative or only slightly positive. This suggested the possibility of active immunization, without the severe reaction, by means of smaller doses. Accordingly, the "skin test dose" in man was 1st ascertained, and further study showed that adults could be immunized by 3 injections of toxin at 5-day intervals, beginning with a dose equivalent to 300 skin test doses and increasing to 1000 such doses. None of a series of individuals thus immunized contracted scarlet fever on exposure to it, while a number of controls did. The immunization must be carried to the

Active immunization with scarlet fever toxin is deemed by Zingher (Intern. Clin., Sept., 1924) a safe procedure if the dose is gradually increased. The dose for children under 12 years of age is 100, 250 and 250 skin test doses, and for persons over that age, 100, 250 and 500 skin test doses; for adults the final dose may be increased to 1000. The immunity results seem encouraging, the Dick test on 274 retested children showing 61 per cent, of negative or negativepseudo-reactions and 24 per cent. of reactions less strongly positive than in the original test.

From Italy are issuing reports on the prophylaxis of scarlet fever with Caronia's vaccine, apparently with successful results. His vaccine is made from the germ isolated by Di Cristina, Caronia and Sindoni. As described by Sindoni (Pediatr., Mar. 1, 1924), it is prepared from material obtained from flourishing cultures of scarlet fever germs at the 12th to the 15th day of growth. Three intramuscular injections of 2 c.c. each were made on 3 consecutive days. A slight general reaction resulted. The serum of children receiving this vaccine deviated complement in the presence

of antigen made either from desquamation scales or cultures of scarlet fever organisms, agglutinated cultures of such organisms, and contained specific opsonins. In 292 children receiving the vaccine, most of whom had been exposed to scarlet fever, the procedure prevented the disease in all except 1 nursling, who had been treated too late in the stage of incubation. The writer regards the vaccine as a reliable prophylactic as well as an evidence of the specificity of the scarlet fever organism referred to. A. Piattelli (Policlin., May 5, 1924) reports having used Caronia's vaccine in 59 children during an epidemic of scarlet fever. None of these children contracted the disease, though exposed to it. M. Gioseffi (Rif. med., Oct. 13, 1924) employed the same vaccine for the protection of 87 inmates of an educational institution during an epidemic, with the result that none of those vaccinated developed the disease.

PASSIVE IMMUNIZATION. — As already mentioned, Dick and Dick have resorted to passive immunization by injection of serum when throat cultures of susceptibles exposed to scarlet fever show hemolytic streptococci. In this connection they (Ther. Gaz., Dec., 1924) use convalescent scarlet fever serum or, if this is not obtainable, concentrated scarlet fever antitoxin obtained by immunizing horses with gradually increasing toxin doses injected subcutaneously. Few and mild serum reactions have resulted from this serum, but convalescent serum is used instead, when available, to avoid sensitization to horse serum.

TREATMENT.—Dochez and his coworkers have prepared a specific antiscarlatinal serum by immunization of the horse to the specific type of hemolytic streptococcus found in scarlet fever by a number of observers, which they term *Streptococcus hemolyticus-scarlatina*. Since the earlier report of IF. G. Blake, J. D. Trask, Jr., and J. F.

Lynch (Jour. Amer. Med. Assoc., Mar. 1, 1924), stating that in 10 cases, single intramuscular injections of 40 to 60 c.c. of Dochez's scarlatinal antistreptococcic serum led to complete recovery in 12 to 24 hours, and in 2 extremely toxic cases, 200 c.c. in divided doses brought about complete recovery in 36 hours, Blake (Boston Med. and Surg. Jour., July 10, 1924) has recorded a further clinical and laboratory study showing that this serum is a valuable therapeutic agent. The serum had then been used in 26 cases, with prompt cure in all but 1. It proved effective not only in early uncomplicated cases, but also in cases with septic complications. In the former type of cases the most striking effects are a critical fall of temperature and pulse rate to normal within 12 to 18 hours, a rapid and complete fading of the rash within 12 to 24 hours, rapid improvement in the angina, and prompt disappearance of all toxic manifestations. Further evidence of the serum's efficacy results from the finding that the serum gives a positive extinction test in scarlet fever; that the blood serum of the treated patient will likewise give a positive extinction test within a few hours after treatment, and that the specific toxic substance found by Trask and Blake in the blood of scarlet fever patients is neutralized in vitro by Dochez's serum.

A scarlet fever antitoxin has also been prepared by Dick and Dick (Jour. Amer. Med. Assoc., Apr. 19, 1924) by immunization of the horse with sterile filtrate from broth cultures of the strain of streptococci with which they had produced experimental scarlet fever in man. The

serum obtained contained in 10 c.c. enough antitoxin to neutralize 20 times the amount of toxin that produced a marked constitutional reaction and rash in susceptible adults.

In a later article (Ibid., Mar. 14, 1925), Dick and Dick state that concentration of the serum and its exact standardization have made its use practical as a routine measure in scarlet fever. Any antitoxin used should be of such strength that 1 c.c. will neutralize 1000 skin test doses [i.e., the amount of toxin producing the marked reaction and rash in susceptibles]. It is possible, however, obtain serums considerably stronger than this. They define as a therapeutic dose that amount which neutralizes 20,000 skin test doses, [this amount being 20 c.c. in the case of the minimum-strength serum just alluded to]. The following table significantly shows the results obtained by Dick and Dick in severe cases, i.e., cases characterized by high temperatures with stupor, delirium or severe septic complications:

RESULTS IN SEVERE CASES.

Series	Number of Cases	Per Cent. Deaths	Post-scarlatinal Nephritis, per Cent.	Otitis Media, per Cent.	Mastoiditis and Otitis, per Cent.	Severe Cervical Adenitis, per Cent.
Control Antitoxin	15 29	20.0	20.0	20.0 6.8	20.0 3.4	33.3 3.4

The single fatality in the group of severe cases receiving antitoxin was due to a neglected mastoid infection. No patients receiving antitoxin on the 1st day of the rash developed any complications or sequelæ. Similar favorable results, as compared to controls, were observed in a group of

moderately severe cases (at least 102° F., with moderate toxemia). In early moderate cases, 1 therapeutic dose suffices. In cases with marked toxemia and sinusitis, or severe cases with septic complications, the writers gave 2 therapeutic doses, always intramuscularly. Best results followed giving the total amount in 1 dose early in the disease. In early cases, if enough antitoxin has been given, the rash will have faded within 24 hours, with marked general improvement and fall in temperature. The antitoxin, by removing the toxic element, unmasks such complications as are already present, making recognition and proper treatment of early complications more certain.

A scarlatinal antitoxin is commercially available which is stated to be both antitoxin and antibacterial, thus offering the combined properties of the Dochez and Dick serums, and to be standardized to 10,000 skin test doses per cubic centimeter. The prophylactic dose is 10 c.c. and the curative dose, 20 to 40 c.c., given intramuscularly, subcutaneously or intravenously.

Convalescent serum has been receiving further recognition as a help in the treatment of scarlet fever. J. Langer (Münch, med. Woch., Jan. 9, 1925) states that after a certain date, among a series of 786 hospital cases of scarlet fever, all toxic and severe cases, 40 in number, were given intramuscular injections of serum collected from children over 6 years of age who had been free of fever 4 to 6 weeks. Serum from 3 donors was mixed, 1 per cent. of phenol added, and the mixture kept cold. The average dose was 40 to 50 c.c., and the extreme range, 30 to

70 c.c. Whereas, among the earlier 494 cases treated without serum, the mortality had been 5.47 per cent., in the 2d series, in which the toxic cases received serum, it was 3.77 per cent. In the toxic cases, serum injection within the earlier days after appearance of the rash nearly always aborted sepsis, and even later, the latter condition could be improved. Favorable effects were seen on the temperature, general state, stupor or delirium, cyanosis and blood picture.

In a boy of 14 years with chronic nephritis of 10 years' standing, and in whom the onset of scarlet fever was attended with severe symptoms, R. J. Weissenbach (Bull. Soc. méd. des hôp. de Paris, Dec. 5, 1924) injected subcutaneously, less than 36 hours after appearance of the rash, 25 c.c. of citrated convalescent blood from the boy's mother, collected 49 days after the onset of scarlet fever in her case. In 12 hours the temperature dropped to normal and the urinary output increased. Complete recovery occurred in a few days, without any appreciable effect of the scarlet fever on the diseased kidneys.

Injections of deproteinized milk from women convalescent scarlet fever were employed in 4 grave cases of scarlet fever by T. Mironescu and M. Gunzburg (Bull. Soc. méd. des hôp. de Paris, July 25, 1924). The proteins were removed by precipitation with absolute alcohol and extraction with ether, 1 c.c. of the resulting product representing about 3 c.c. of the original milk. Removal of the proteins had been found not to eliminate the therapeutic The doses used averaged 10 to 12 c.c., given intramuscularly. A single injection caused a drop of temperature of 1 to 2.5° C. (1.8 to 4.5° F.) and general improvement.

One patient, a woman of 40, whose scarlet fever was superimposed upon chronic alcoholism, syphilis, hepatic cirrhosis and nephritis, died although a marked fall in temperature had followed the 1st injection. The writers regard the convalescent milk product as having the same therapeutic value as convalescent serum.

In the absence of fever and albuminuria, Lesné and Lamy (Bull. Soc. de péd. de Paris, Oct.-Nov., 1924) deem a mixed diet of vegetables, milk products, fish and meat advantageous in scarlet fever convalescents, beginning from the 15th to the 20th day. In over 1000 cases this diet was found Zomotherapy in the satisfactory. form of administration of 100 Gm. of raw horse meat in 15 convalescent children proved of marked advantage in a comparison with 15 other children who were given the same quantity of cooked meat, the former group gaining twice as much weight in a month, becoming stronger, and improving more in color and subjectively than the latter group. The raw muscle tissue is asserted to be transformed into human muscle more readily when not altered by cooking.

Regarding the prevention and treatment of car and nose complications in scarlet fever, T. N. V. Potts (Ann. Pickett-Thomson Res. Lab., July, 1924) reports 258 cases given prophylactic injections of a stock detoxicated vaccine. Twenty-five subsequently developed rhinorrhea, otorrhea or both, as against 61 among 453 cases that had received no injections-a difference in percentage of 9.6 as against 13.5. As for autogenous vaccines, the cases in which they are of actual service are probably those in which the adenoid and tonsillar tissues are not excessive or considerably damaged by previous disease.

In a case of scarlet fever in a child of 4 years complicated with erysipelas and streptococcus septicemia, after an injection of Dochez's serum had apparently been of no avail, H. H. Young and K. Birkhaug (Jour. Amer. Med. Assoc., Aug. 16, 1924) gave an intravenous injection of 15 c.c. (1/2 ounce) of a 1 per cent. solution of mercurochrome-220 soluble, the dose of the drug equalling 7.5 mgm. per kilo of body weight. In 12 hours there was complete sterilization of the blood, and next day the general physical and mental condition had improved markedly without any untoward symptoms from the mercurochrome. Eight days after the injection the patient was discharged in excellent condition.

SCIATICA.—From anatomic investigations and clinical studies of 21 cases, M. S. Danforth and P. D. Wilson (Jour. of Bone and Joint Surg., Jan., 1925) conclude that sciatic pain without obvious cause is a symptom of disturbance in the lower lumbar spine, and that the site of the lesion is most frequently the lumbosacral junction and the nerve chiefly involved the 5th lumbar.

The opinion of Scandinavian observers that "sciatica" is a muscular disorder due to strain is endorsed by E. Warburg (Ugeskr. f. Laeg., June 12, 1924). Palpable changes are found at some point in the back of the leg, and the pain along the nerve is merely referred pain. In support of this conception the writer makes Lasègue's test for sciatica, viz., flexes the hip while maintaining extension at the knee, until the usual pain, referred to the leg or hip, is experienced. If now, the Lasègue maneuver is supplemented by reversing the movement at the hip a few degrees, the pain stops but is brought on again if, with the limb kept in the same slightly relaxed position, pressure is made on the tendons of the ham-string muscles, particularly the biceps. This result, verified in 25 cases of sciatica, is taken to show that the pain does not arise in the nerve, but in the muscles.

TREATMENT.—A simple maneuver for the relief of sciatica, successful in the author's own person as well as in other cases, has been described by Jaquerod (Rev. méd. de la Suisse rom., Apr., 1924). The procedure was conceived by analysis of movements made by him when seized with a severe attack of recurrent sciatica while riding on horseback, these movements having brought abrupt relief from the pain. As adapted for clinical use, the maneuver is as follows: (1) Lie flat on a hard mattress; (2) straighten the affected leg, applying the sole of the foot against the foot of the bed; (3) turn the foot and, at the same time, the whole limb up to the hip-joint, in the direction of supination, while pressing hard with the heel against the foot of the bed; (4) twist the upper part of the body in the opposite direction, at the same time straightening out the trunk and raising the shoulders as much as possible. The whole limb is thus extended to the utmost and twisted from hip to heel in 1 direction while the trunk is extended and twisted in the opposite direction. The relief is sometimes as sudden as in reduction of a dislocated shoulder by Kocher's method.

Recent and mild cases of sciatica are usually cured, according to A. F. Hertzler (Amer. Jour. of Surg., Apr., 1924), by 1 injection of 15 to 30 c.c. (½ to 1 ounce) of 1 per cent. quinine and urea hydrochloride solution into and in the vicinity of the nerve, while long-standing cases may require 4 or 5 injections at intervals of 2 or 3 weeks. Attempt is made to

inject 5 c.c. (80 minims) of the solution directly into the substance of the nerve and the remainder in its immediate vicinity. Lying on the well side, the patient has the thigh and leg on the affected side half flexed. At a point somewhat lateral to the midpoint of a line joining the ischial tuberosity and great trochanter, a wheal is 1st made with a fine needle, and a larger needle, 4 or 5 inches long and of 18 gauge, is then introduced slightly upward and inward. If it strikes the nerve the usual pain shooting down the leg is felt, while to the operator it feels as if the needle had passed into a rubber tube. If the neck of the femur is struck, the needle is partly withdrawn and started in new directions until the nerve is located.

In severe cases Högler (Wien. klin. Woch., Jan. 15, 1925) had good effects from perineural injections of 10 c.c. (2½ drams) of distilled water containing 4 Gm. (1 dram) of antipyrin and a little procaine.

Garofeano and B. Labin (Arch. méd. belges, June, 1923) found valuable in the painful attacks of 7 cases of acute and 3 cases of chronic sciatica epidural injections of 25 per cent. solution of C. P. magnesium sulphate to the amount of 1 c.c. (16 minims) per 20 kilos. (44 lbs.) of body weight. They deem the epidural injections more effective and less disturbing to the patient than intraspinal injections. Several injections of 2 or 3 c.c. of the solution are also made at painful points along the course of the sciatic nerve, the total amount used in all the injections being 10 c.c. (169 minims). The effect of the epidural injections is practically a physiologic section of the cord,

and there may be slight disturbance of the sphincters and respiration. The analgesic effect begins in 1½ to 3 hours, is more pronounced the next day, and persists 2 to 4 days.

According to O. Wiedhopf (Beit. z. klin. Chir., cxxxii, 523, 1924), local hyperemia is the chief factor in the efficacy of the various procedures used in sciatica, even in root sciatica if it is ascending, as in diabetes and many intoxications. The injection treatment is the simplest and least radical, but the writer finds it best to use combined nerve trunk injection and epidural injection.

X-ray treatment has been recommended recently by several observers. Kahlmeter (Hygiea, Jan. 15, 1925) refers to 33 cases, of 1 to 3 years' standing, and bilateral in 8. The nerve-roots were irradiated between the 12th dorsal vertebra and the lower part of the sacrum, while in the presence of tenderness in the gluteal region, this was also included.  $\Lambda$  4 mm. aluminum filter was used, and the dose was \% skin unit. Where 1 treatment did not suffice, the procedure was repeated in 2 or 3 weeks. Complete recovery was obtained in 55 per cent. of the cases and improvement in 30 per cent., while 15 per cent. were unimproved.

SCOLIOSIS.—A new type of mechanical treatment is described by R. W. Lovett and A. H. Brewster (Jour. of Bone and Joint Surg., Oct., 1924), having in view the inefficiency of ordinary methods that exert pressure directly against the apex of the lateral spinal curve. In the writer's method the mechanics are such that the ends of the arch are spread, with the apex of the curve used as a point of resistance. A close-fitting plaster

jacket is applied which extends from the axillæ to below the greater trochanters. It is cut off and from it is prepared a torso which, by later trimming, shaving and filling, is made to represent the patient in a somewhat better position than was obtained in the original jacket. To this torso another plaster jacket is applied, cut off by a midline cut in front, trimmed for comfort, and then divided transversely at the level of the apex of the lateral curve. Over this apex it is provided with a hinge, and on the opposite side, at the same level, a turnbuckle connecting the 2 segments is provided, whereby the jacket can be forcibly opened on the concave side of the lateral curve. Locks are attached which will maintain any desired position, and the turnbuckle is removable when the position has been adjusted. With this apparatus the patient is given 1 or 2 stretchings a day, each of from ½ to 1½ hours, at the close of which the jacket is locked in the most corrective position that is comfortable and the turnbuckle removed. The jacket is made firm enough to exercise the desired pressure by means of steel strips, and can be worn under the clothes without especial disfigurement. treatment is supplemented by gymnastics and manipulations.

SCORPION STING.—For the relief of pain in this condition, N. A. D. Sharp (Jour. of Trop. Med. and Hyg., Dec. 15, 1924) injects into the wound 1 c.c. (16 minims) of a 5 per cent. solution of procaine in 1:1000 adrenalin solution. The pain is immediately cut short. Such an injection was made for a like purpose in a case of fish sting, and it is sug-

gested that it be employed also in snake bite. R. Kraus and Rocha Botelho (Brazil-med., Mar. 3, 1923) state that they now have an effectual antitoxin for scorpion stings.

**SEASICKNESS.**—Suppositories containing chloral hydrate, 15 grains (1 Gm.), and a bromide, 30 grains (2 Gm.), are recommended by V. Moxey (Brit. Med. Jour., Dec. 6, 1924). For preventive purposes, 1 should be inserted morning and evening for the 1st 3 days at sea. If the patient is sick when 1st seen, 1 should be given at once and repeated every 2 or 3 hours, as required, for 4 doses. If the sea passage is short, a suppository is used 3 hours before going on board and another just before departure. The treatment is without risk if stopped when somnolence appears. Subsidiary measures are recumbency, warmth, keeping the eyes closed, and an abdominal belt.

Le Fort is credited (Trib. méd., Sept., 1924) with advising, as a preventive measure, that the patient take care to breathe out as the vessel descends into the trough of the waves and in as it rises again. This prevents the vacuum effect on the cerebral circulation which results when, as is usually the case, inspiration is carried out during the downward excursion of the vessel. Genée (Münch. med. Woch., Feb. 8, 1924) notes that if the head is kept hot, seasickness does not occur. The required condition is best maintained, not by wrapping the head in hot wet towels, but, as suggested by Leege, by causing a continuous hyperemia of the brain by means of a bandage about the neck. The bandage used is

specially adapted for compression of the jugular veins. With the patient sitting in a deck chair-not lying down-the bandage is applied when dizziness or nausea is 1st noticed. In 1/2 hour the face becomes red, the previously apathetic patient becomes interesting in his surroundings, and the respiration becomes deeper and more regular. In 1½ hours the symptoms are reduced to an endurable Among 30 cases the minimum. bandage was worn continuously for 30 hours in 2, for 18 hours in 7, and for 7 hours in others. It possesses considerable prophylactic value.

R. Dubois (C. r. Soc. de biol., Feb. 22, 1924) ascribes seasickness and mountain sickness mainly to excess of carbon dioxide in the blood, with resulting pneumogastric stimulation. He has found oxygen inhalation always effective in the treatment.

**SEMINAL VESICLES.**—For the differentiation of chronic seminal vesiculitis from prostatitis, Ballenger and Elder (Jour. of Urol., Nov., 1923) find examination of a condom specimen of the semen for pus a procedure of definite value.

Massage as a measure in the treatment of inflammatory conditions of the seminal vesicles and prostate is discussed by F. J. Baum (Jour. Okla. State Med. Assoc., Mar., 1924). In the most efficient and modern technic of prostatic massage, the patient stands 12 inches from a table about 30 inches high, with his feet 12 inches apart, toes markedly adducted, forearms lying flat on the table, head resting on his hands, and back straight. The index finger, protected with rubber and well lubricated, is inserted and makes gentle to firm pressure with a stroking downward movement toward the opening of the prostatic ducts in the deep urethra, 3 or 4 strokes 1st

over one lobe and then the other. The finger is finally drawn from above downward over the posterior urethra. This may be continued for 3 to 4 minutes and repeated 2 or at most 3 times a week. Better results, especially in massaging the seminal vesicles, are obtained if the patient comes with a well-filled bladder. The object of the massage being partly to stimulate repair by bringing more fresh blood and lymph to the tissues, the writer enhances its effects by application of heat by means of a box 2 ft. square covered with an ordinary toilet seat and fitted within with 24 50-watt electric light bulbs, which raise the temperature in the box to 150° F. The patient sits on the box for 20 to 25 minutes prior to the massage. The heat assists also by softening the secretions.

Stress is laid by D. E. Shea (Jour. Amer. Med. Assoc., Jan. 26, 1924) on the cases of seminal vesiculitis complicated by arthritis, of which 27, in his experience, were gonorrheal and 7, nongonorrheal. Contributory foci of infection were found in the teeth, tonsils, intestine and furuncles. In acute seminal vesiculitis, vaccines and hot and cold rectal douches constitute the treatment of choice. After the acute stage has subsided, stripping of the vesicles is indicated. The writer has also used vas puncture with injections of 10 per cent. collargol. In the acute gonorrheal type, mixed gonococcic vaccines have been injected with good results. In suppurative vesiculitis with abscess formation, vesiculotomy is indispensable for drainage, while in the hard, sclerotic vesicle. vesiculectomy, preceded by massage, is the procedure of choice,

**SEPTICEMIA.**— G. W. Crile (Arch. of Surg., Mar., 1924) finds that septicemia is uniformly accom-

panied by histologic changes in the brain, liver and suprarenals. 1st histologic effect of injection of a toxin was to increase the activity of the brain cells, as indicated by an increased hyperchromatism. As the period between the injection of the toxin and the death of the animal was increased, there occurred a progressively increasing disintegration of the brain cells through the stages of fatigue to exhaustion. The histologic changes in the adrenals appeared only in the cortex. When the toxin was preceded by a massive dose of morphine or followed by frequent doses, the histologic changes were markedly diminished, as also by continuous ether or N2O anesthesia. The liver and adrenals appear to be associated with the brain in the production of the phenomena which are initiated by the changes in the brain. The latter seems to be the primary factor in the response to infection.

In toxic and bacterial injuries produced by infections, severe changes appear almost always in the suprarenal cortex, according to W. Deucher (Arch. f. klin. Chir., Sept. 22, 1923). In sepsis and peritonitis the lipoid disappears, usually first in the glomerular and reticular zones. Along with this atrophy of the lipoids, the crystallizing ability of the latter is increasingly lost. Edema and hyperemia coexist. In peritonitis these changes are rapidly progressive and pronounced; in sepsis, they are slower, milder and variable.

TREATMENT.—Steady diminution in the number of bacterial colonies and final sterilization of the blood stream under blood transfusion have been observed by R. E. Stetson (Amer. Jour. Med. Sci., Oct., 1924) in a sufficient number of cases to convince him that normal blood has a very real value as a bactericidal

agent. Its value varies, of course, according to the virulence and character of the organism, the focus of infection and the phagocytic power of the blood employed. It also has power to overcome secondary anemia and build up the general condition. He prefers whole blood to citrated blood, and uses the syringe-cannula method. In most instances it is best to give only 500 to 600 c.c. of blood, and less in children. He usually withdraws from the patient ½ to 3/3 of the amount to be given just before starting the transfusion. Among 68 cases of sepsis thus treated, there were 31 recoveries and 37 deaths, but of the latter group, 7 had malignant endocarditis and 4 were moribund at the time of transfusion. A fighting chance thus existed in only 57, giving a ratio of 31 recoveries to 26 deaths, and of these, 7 died of a complicating pneumonia and 5 of meningitis. A great many patients could be saved if transfusion were started early and given every 48 hours until the blood cultures became sterile and clinical improvement sufficient to warrant stopping. The use of immunized donors has not proved to be very beneficial.

In a 15 months' infant practically moribund from staphylococcus septicemia, D. T. Smith and H. Casparis (Jour. Amer. Med. Assoc., Dec. 29, 1923) gave 3 injections of a 0.25 per cent. aqueous solution of gentian violet at 24-hour intervals. For the 1st dose, 5 mgm. of the dye per kilo. of body weight were given, and for the 2d and 3d, 3 mgm. Blood cultures before the 2d and 3d injections had become sterile, and after the 3d his appearance was improved and the fever and leukocytes reduced. Recovery followed.

[See also Mercury: Mercurocurome and Puerperal Infection.]

SERUM DISEASE.—A case of late serum sickness in a woman of 26 years is recorded by T. T. Crooks (Jour. Amer. Med. Assoc., Jan. 12, 1924). Refined diphtheria antitoxin, 20,000 units, had been given intramuscularly. Four days later there was slight redness at the point of injection and the patient was nauseated. The urticaria increased until it covered the whole body and was associated with continuous vomiting, unconsciousness and severe joint and muscle pains. Administration of 10 minims (0.6 c.c.) of adrenalin solution hypodermically every 2 hours for 5 days brought relief. On the 4th day of the urticaria she was also helped considerably by alkaline tub baths.

SHOCK, -Experiments reported by R. Simon and R. Fontaine (Rev. de chir., Sept., 1923) showed that shock induced by laparotomy and evisceration in rabbits is followed by leukopenia, a fall of blood-pressure, and inversion of the leukocytic These effects, which are formula. similar to those of "hemoclastic shock," are ascribed to a visceral reflex the afferent impulse of which passes along the vagus. The deeper the anesthesia, the less the shock. By very deep anesthesia, obtained with ether, ethyl carbamate subcutaneously or chloralose intravenously, the shock was completely eliminated. Hence, in surgery, anesthesia should be sufficiently deep. If not, severe shock may occur even in minor procedures such as reduction of a dislocation, dilatation of the anus, etc. Strychnine may increase the shock through stimulation of reflex action.

A reduction of blood-pressure in traumatic shock was observed by J. H. and H. Oltramare (Schweiz. med. Woch., May 1, 1924) even in rabbits with anesthetized bulbar centers. This is taken to show that the initial lowering of the pressure in shock takes place through a peripheral mechanism. The same observers (Ibid., Oct. 2, 1924) have confirmed the view that the red cell count rises in shock. In conjunction with the finding of a reduced total volume of circulating blood, this fact tends to indicate an exemia, or loss of some of the fluid from the blood by reason of its passage into the tissues.

W. T. Porter (Amer. Jour. of Physiol., 1925), from clinical and experimental studies, believes that shock is the final common scene in various and quite distinct pathologic states. In 1 group, it occurs without injury to the vasomotor center, viz., in hemorrhage, dilatation of the abdominal vessels without injury to the vasomotor paths, and injuries that sever the vasomotor paths running to the splanchnic area. In the 2d group, the vasomotor center is from the start directly attacked, vis., in concussion of the vasomotor cells, fat embolism of the vasomotor region, and the action of certain poisons on the vasomotor cells. Shock is readily produced by very small quantities of fat injected into the bulbar vasomotor region through the vertebral arteries. In war, injuries of long bones, setting free fat, are probably the most frequent cause of shock.

Declairfayt's index of predisposition to operative shock is endorsed by Froes (Brazil-med., Jan. 10, 1925). When the systolic pressure (determined with the oscillometer) is multiplied by 100, and the product is divided by the product of the hemoglobin percentage multiplied by the number of 100,000s of red cells in the blood, the result should not exceed 7; otherwise, shock is almost certain to occur.

TREATMENT.—According to Porter (loc. cit.), a successful systematic treatment of shock, e.g., in wounded soldiers, may be based on the following principles: (1) Recognition of the diastolic rather than the systolic pressure as the basis of diagnosis and treatment; (2) recognition of a critical level of the diastolic pressure in shock; (3) maintenance of the diastolic pressure somewhat, but not too much, above the critical level, as determined by very frequent pressure readings. Measures that raise the diastolic pressure in shock even 15 mm. may save life. A new remedy, often successful in raising the diastolic pressure to this extent, is found in the increased action of the respiratory pump secured by augmenting the carbon dioxide in the inspired air.

In shock the body cells cannot, according to D. Fisher and M. Snell (Jour. Amer. Med. Assoc., Dec. 13, 1924), metabolize introduced carbohydrate as quickly or satisfactorily as under conditions of normal meta-Glucose given in conjunction with insulin will supply muchneeded energy in these cases. In 3 cases, insulin subcutaneously and glucose intravenously caused much more rapid cessation of typical surgical shock than any methods previously tried. The writers give 500 to 1000 c.c. ( $\frac{1}{2}$  to 1 quart) of sterile 10 per cent. glucose solution, according to the severity of the condition. At least 1 hour is consumed in its administration. The insulin is divided into 2 equal doses, 1 given 5 minutes after the start and the other at the end of the glucose administration.

Courty, Piquet and Mocquot (Bull. Soc. nat. de chir., L, 888, 1924) lay stress on the circumstance that upon release of a tourniquet after recovery of an injured patient from shock, toxic wound products may diffuse the body and lead to rapidly fatal toxic shock. In a case they report the crushed left leg was to be amputated on the day after the injury. Upon removal of the tourniquet there was no hemorrhage, but in 3 or 4 minutes the patient developed hurried respiration, cold sweat, dilated pupils, cold extremities and weak pulse. In spite of prompt reapplication of the tourniquet, death occurred in 15 minutes. In this case the femur was fractured in 2 places. In a case with a toxic wound and dead tissue, amputation or excision should be done previous to removal of the tourniquet. Amputation is strongly indicated when a tourniquet has been on a long time and a toxic accumulation is suspected. Where a conservative operation is intended, much of the dammed up venous blood is allowed to escape by Rouhier before release of the tourniquet, while Quénu bathes the injured region with hypertonic salt solution.

sinusitis.—Diagnosis.—In the examination of the posterior group of sinuses, direct sunlight, according to J. D. Heitger (Ann. of Otol., Rhinol. and Laryng., Sept., 1924), is the best form of illumination for posterior rhinoscopy, and next to it, the arc light. The X-ray has not come up to expectations as a diagnostic aid. Transillumination is of help only in a study of the antra; its value in study of the frontal sinuses is problematic. Frontal sinus disease is usually excluded

by the X-ray. Disease of the ethmoid cells is diagnosed by anterior and posterior rhinoscopy and the nasopharyngoscope. Antrum disease is diagnosed by puncture, aspiration and culturing, and sphenoid disease, by sounding, aspiration and culturing. The X-ray is of great value in determining the presence and size of the sinuses.

In cases in which the clinical history is suspicious of subacute or chronic maxillary sinusitis, but the X-ray and puncture washings are negative, W. Spielberg (Laryngosc., Mar., 1923) recommends puncture in the usual manner and insertion of the nasopharyngoscope into the sinus. This helps determine what cases shall be radically operated and permits continuous study of the tissue changes in the antrum. clouding nearly always means some pathologic process in the sinus, but whether the condition is due to acute congestion, atrophy with fibrous changes in the mucosa, polypoid degeneration, hypertrophied mucous membrane, a tumor or fluid, can only be determined by antroscopy. An acute congestion will give a marked clouding on the X-ray plate, while extensive polypoid degeneration may give only a slight clouding.

TREATMENT.—In acute antral disease of intranasal origin cocaine and adrenalin applications are indicated, as stated by H. Tilley (Arch. internat. de laryng., etc., Mar., 1923), to establish drainage. Calomel, saline purgatives, pyramidon and acetylsalicylic acid are available to relieve the congestion and pain. As soon as suppuration appears, puncture-lavage daily or on alternate days is required. Only once has he found

it necessary to make a large opening in the inferior meatus for acute sinusitis. If, after 2 or 3 weeks, daily irrigations fail to arrest the suppuration, it is wise to make such an opening. In chronic antral disease he employs the Caldwell-Luc operation or the single intranasal procedure. Where the middle meatus is normal, without polyps or polypoid hypertrophy, the intranasal route is generally sufficient.

In acute infections of the antrum and frontal sinus, J. D. Osmond (Amer. Jour. of Roentgenol., May, 1923) advocates X-ray treatment, which, in his experience, brought relief of all symptoms and cessation of pus in all cases. A rapid or forced resolution of the inflammatory process seems to take place. mucosa remains thickened, as evidenced by clouding. The X-ray offers a method of preventing acute catarrhal conditions from becoming purulent, and acute purulent sinusitis from becoming chronic. It should not be used in chronic cases.

In the resistant form of frontal sinusitis in which fusiform bacilli and spirilla are found in the pus, the condition nearly always becoming chronic, P. Castex (Arch. internat. de laryng., etc., Mar., 1923) uses for irrigation a solution of 0.15 Gm. (2½ grains) of neoarsphenamin in 30 c.c. (1 ounce) of boiled water, with excellent results. Any recurrences soon clear up on further lavage, and a cure ultimately results.

SKULL, FRACTURE OF. See Fracture: Skull.

SLEEPING SICKNESS. See ENCEPHALITIS, EPIDEMIC, and TRYPAN-OSOMIASIS.

SMALLPOX. See VARIOLA.

SNAKE-BITE.—J.C. Singh (Indian Med. Gaz., Oct., 1924) reports a case of bite by an *Echis carinatus* in which recovery followed initial introduction of potassium permanganate crystals into the previously incised punctures, ingestion of a stimulant mixture, and in particular, repeated intravenous injections of 1 pint of hypertonic saline solution, continued for nearly 24 hours, and hypodermics of adrenalin and pituitrin.

## SODIUM CACODYLATE.-

D. M. Vasavada (Indian Med. Gaz., Mar., 1924) reports having used this drug intravenously in 15-grain (1-Gm.) doses twice a week in anemia, sprue, syphilis, chronic bronchitis, psoriasis, and any other condition in which arsenic was believed indicated. In some cases of primary and secondary anemia in which 2-grain (0.13-Gm.) doses had been given on alternate days, a single dose of 20 grains (1.3 Gm.), followed by another 3 days later, showed that to be really effective the drug should have been given in these larger doses. The range of dosage used with good results was from 10 to 30 grains (0.6 to 2 Gm.), administered in 5 c.c. (80 minims) of water, twice a week. E. Orbach (Deut. med. Woch., Oct. 3, 1924) witnessed impairment of the patients' general condition in 4 cases of paralysis agitans or postencephalitic Parkinsonism receiving the massive doses advocated by Rodriguez-1.5 to 6 Gm. (23 to 90 minims) of a 50 per cent. solution, intravenouslybut had good results, without harmful effects, in 8 cases of the above-mentioned type of disorders with Henner's plan of giving 0.25 to 1 Gm. (4 to 16 minims) of a 50 per cent. solution of the cacodylate intravenously, 3 times a week, 1st ascending and then descending.

SODIUM PHOSPHATE.—H. J. Vetlesen (Norsk Mag. f. Laeg., May, 1924) relates that he has been using acid sodium phosphate for 30 years in such conditions as neurasthenia, psychasthenia and general weakness, with gratifying results. His belief in its value was supported by Embden's

research during the war, which showed that the output of work by soldiers given a single dose of 5 to 7.5 Gm. (75 to 115 grains) of phosphate was 10 to 30 per cent. greater than that of controls receiving water containing sugar and vinegar. There is also a mental stimulating effect and promotion of the vital functions in general. In over 100 cases of simple goiter, the writer found the enlargement of the thyroid arrested, even somewhat reduced by the phosphate. In 77 cases of exophthalmic goiter, he gave a daily dosage of about 4 Gm. (1 dram) in the form of a tablespoonful of a 6 per cent. solution 4 times daily. Under this treatment, he finds nervous balance is restored, the heart quieted, and the tremor eliminated, while the goiter is checked or becomes smaller and softer. In 1 case, twice operated, in which there remained exophthalmos and a pulse of 158 though no thyroid remnants were palpable, marked improvement occurred under sodium phosphate taken for years, with short intermissions. The writer notes that Von Noorden has been using the drug of late in convalescence and as a general tonic in tuberculosis and diabetes.

SPASMOPHILIA.—TREAT-MENT.—P. Woringer (Rev. de méd., xli, 356, 1924) states that a 5minute daily exposure to 3000 candlepower mercury vapor quartz lamp suffices for the cure of spasmophilia and rickets. Two, or at most 3, treatments weekly would suffice for their prevention. All child welfare centers should be equipped with such a lamp for regular use on all children brought in, especially those from 3 to 18 months of age. With this procedure spasmophilia and rickets would completely disappear. severe cases, according to Woringer Zehnter (Nourrisson, Nov., 1923), the ultra-violet rays or sunlight should be supplemented with 100 c.c.  $(3\frac{1}{3})$  ounces of a 5 per cent. solution of calcium chloride every day for a week. György is quoted

by Wejdling (Hygiea, Sept. 15, 1923) to the effect that a daily dose of 5 Gm. (75 grains) of ammonium chloride by mouth will remove all manifest symptoms of spasmophilia in 1 or 2 days.

According to Loretti (Riv. di clin. ped., Nov. 10, 1924), cow's milk should be replaced by an **emulsion of soy beans** in the feeding of spasmophilic infants.

SPASTIC PARALYSIS.— J. J. Hunter performed experimental work which led him to the conclusion that there are 2 kinds of striated muscle, differing physiologically as well as morphologically, viz., the sluggish red muscle, consisting chiefly of slender fibers innervated mainly by fine nerve fibers from the sympathetic system, and the briskly reacting and easily fatigued white muscle, consisting of thick fibers innervated by large medullated nerve fibers from the cerebrospinal nervous system. As described further by Hunter and G. E. Smith (Brit. Med. Jour., Jan. 31, 1925), the muscle fibers receiving somatic (cerebrospinal) nerve-endings are concerned in shortening as the result of voluntary and reflex activity, while the fibers innervated by the sympathetic are 1st inhibited and then lengthened and shortened during these processes, and remain at the new length passively imposed upon them, i.e., these fibers exhibit what Sherrington has termed "plastic During movement, these fibers aid in supporting the weight of the moving part; at the termination of the movement they take part in maintaining the position attained as a result of the movement.

vertebrate animals there are separate

movement and fixing muscles, while

in vertebrates these are combined in the skeletal muscles.

Upon the above considerations is based the operation of sympathetic ramisection employed by N. D. Royle in spastic paralysis. This observer (Brain, Aug., 1924) noticed, in experiments on goats, that after transverse section of the spinal cord, when the reflex activity of both lower limbs is increased, section of the abdominal sympathetic trunk on 1 side led to a marked change in posture of the corresponding limb. If the sympathetic was cut on the left side, the left lower limb fell into abduction and extension, while the knee-jerks and ankle-jerks showed a lessened amplitude as compared to the right side. The right limb, on the other hand, showed the marked increase in reflex activity customary after spinal section. The operation in the human subject, as described by Royle (Med. Jour. of Austral., June 14, 1924), consists, in the case of lumbar ramisection, in making an incision from the last rib to the iliac crest and thence forward to the anterior superior spine, reflecting a flap forward, and exposing the sympathetic trunk. The 4th lumbar ganglion is lifted from its bed and its lateral, posterior and inferior connections severed, while the medially directed fibers are preserved. The upper limit of the operation is at the 2d lumbar ganglion. The rami communicantes are divided by avulsion. After ramisection of the 2d, 3d and 4th ganglia, the sympathetic cord is divided below the 4th ganglion and the operation completed. An analogous cervical ramisection is also feasible when indicated. It aims to remove the influence of the gray rami upon the

roots of the brachial plexus. In dealing with each nerve root all anterior connections are divided right up to the intervertebral foramina.

Describing the clinical results he has obtained with sympathetic ramisection, Royle (Brain, Aug., 1924) refers in detail to 2 cases of spastic paraplegia. One, a man of 30 years, had had an extensive laceration of the cerebral cortex at 23, and had spastic hemiplegia on the right side, with involvement also of the left leg and foot. The gray rami to the 5th lumbar nerve and sacral nerves having been divided through the operation of lumbar ramisection, 54 days later the patient could relax the previously spastic limb almost normally when walking. The knee-jerks were now practically equal on the 2 sides, there remained no sign of abnormal tone in the muscles of the right lower limb, and the patient's chronic constipation had cleared up entirely. The 2d case was 1 of right-sided hemiplegia of 14 years' standing in which cervical ramisection was performed, with a resulting remarkable gain in voluntary control of a previously useless hand.

Altogether, the writer has performed ramisection in about 60 cases, including such cases as hemiplegia of infancy in children of 4 and 9 years, in which the operation was for relief of the upper extremity; a case of syringomyelia, where its object was to permit of the sitting posture, and a case of infantile diplegia, both lower extremities being dealt with. In general, the indication for the operation is excessive plastic tone, and the main contraindication to it, absence of cortical control. A complete lesion in the internal capsule, or a more or less complete lesion in lateral sclerosis

or trauma of the spinal cord, will not be appreciably improved. Return of function cannot be expected, moreover, when the cortico-spinal paths are obliterated. In cases of the paraplegias or hemiplegias of infancy, where the lesion is more or less confined to the cortex, as well as in traumatic cortical lesions, excelled results are obtained. treatment of spastic paralysis by ramisection is, according to Royle (Surg., Gyn. and Obst., Dec., 1924), sufficient in a few instances to allow the patient to move freely after operation. In the greater number, educative or reëducative measures must be added, since the spastic paralytic, when the obstruction to movement presented by excessive plastic tone has been relieved by the operation, only very rarely is found to have the power to execute coordinated movements by combining the actions of groups of muscles.

The later experimental and clinical studies of A. B. Kanavel, L. J. Pollock and L. E. Davis (Arch. of Neurol. and Psych., Feb., 1925), intended to reproduce, if possible, and illuminate the results reported by Hunter and Royle, are not very favorable. Their conclusions are as follows: Histologic evidence points to dual innervation of skeletal muscle from the cerebrospinal and sympathetic nervous systems. perimental removal of the sympathetic trunks in cats produces no effect on normal muscle tone. One or all of several mechanisms may be responsible for changes in muscle Tracings of tendon reflexes, faradic stimulation, active and passive motions and tremors before and after removal of the sympathetic nerve supply showed no changes in

cases of paralysis agitans or lateral sclerosis. Patients in whom increased spinal activity, contractures and fibroses mask plastic tone are unsuitable for the operation of sympathetic ramisectomy.

In cerebral spastic paralysis, the plan of treatment described by F. D. Dickson (Jour. Amer. Med. Assoc., Oct. 18, 1924) varies according to whether it is applied immediately after birth, during the first 3 or 4 years, or in the chronic or final stage. In the 1st stage repeated lumbar puncture may reduce the extent of the lesion and of permanent impairment. In the 2d, daily stretching to prevent contractures and instruction in posture and muscle control are in order. Some very interesting results have been obtained with pituitary gland extract (whole) in doses of 15 grains (1 Gm.) daily; improvement is greatest in cases with pronounced mental impairment. The 3d stage treatment comprises muscle training and operative procedures, vis., tenotomy, tendon transplantation, and the Stoffel operation of removing a section of nerve bundles that supply the group of spastic muscles. The lastmentioned operation has been found best by the writer for reducing spasticity and contractures. It was performed in 39 out of 92 cases, with excellent results in 10, good in 13, fair in 14, and no change in 2.

SPIDER-BITE.—According to W. J. Baerg (Jour. of Parasit., Mar., 1923), the bite of the spider known as "black widow" may cause not only unpleasant but at times dangerous results. The best treatment is a hot bath—as hot as the patient can stand—3 or 4 times in 24 hours, always with

the region of the bite in the hot water. In a bite on the hand or foot, much more frequent hot bathing of the part may be availed of.

# SPINAL CORD.-DIAGNOSIS.

-Gnudi's reflex (posterior tibial reflex) is discussed by G. Gelli (Gior. di clin. med., Dec. 10, 1923). Upon percussion with a plexor below and in front of the internal malleolus, with the limb held in slight external rotation and semiflexion and the heel supported by the hand, a positive response is marked by a slight extension of the foot, elevation of its inner border, and a more pronounced adduction of its inner portion. The writer found this reflex regularly positive in pyramidal tract lesions. It proved almost as constant as Babinski's (101:104), and may be substituted for it where Babinski's cannot be elicited on account of such conditions as ankylosis, absence of the great toe, or resistance because of intercurrent or defence movements. As another sign of pyramidal tract disease, especially when irritative rather than destructive, I. L. Meyers (Cal. and West. Med., Dec., 1924) stresses the progression reflex of Marie and Foix, in which reflex flexion of the limb occurs on passive flexion of the toes. This reflex may be present in the absence of a Babinski or of a reflex of defence.

In 6 cases of tumors or inflammatory processes comprising the cord, Sahlgren (Hygiea, Jan. 31, 1923) found the Queckenstedt sign of considerable diagnostic value. A lumbar puncture is done with the patient recumbent and the veins in the neck compressed on 1 or both sides. Normally the spinal fluid pressure rises abruptly as a result, but in cord compression, even very early, the rise is absent or sluggish on account of the obstruction in the spinal canal. Eskuchen (Klin. Woch., Oct. 7, 1924) supplements the preceding maneuver with a suboccipital puncture. The compression of the jugular veins always causes increased pressure in the cisterna, and comparison with the lumbar pressure facilitates recognition of a complete block between the 2 and permits diagnosis even of partial block.

CONCUSSION. — Concussion of the cord, according to G. B. Hassin

(Arch. of Neur. and Psych., Aug., 1923), can produce definite histopathologic lesions in the form of foci of softening which do not depend on the condition of the spinal column, meninges or vessels. These foci may escape detection on superficial examination, and may be confined to the gray matter. The clinical phenomena may be extremely polymorphous; they may be those of myelitis, disseminated sclerosis, syringomyelia, spinal muscular atrophy or even amyotrophic lateral sclerosis. onset of symptoms may be slow and the course progressive. In the case the writer reports, a man of 60, after tripping and falling, felt sharp pain in the upper spine. Four weeks later he began to develop weakness in the hands, then the legs, wasting and some difficulty in walking. He died of pneumonia 2 weeks after an operation which revealed little to account for his condition. The cord showed widespread degeneration of the ventral horns with microscopic foci of softening, especially in the lower portion of the cervical enlargement of the cord; also, secondary degeneration of some fibers of the crossed pyramidal and certain other tracts.

TUMOR.—Of cord tumors 60 per cent., according to W. E. Dandy (Ann. of Surg., Jan., 1925), can be totally removed without chance of recurrence. In about 90 per cent. of cases the history and neurologic examination suffice for a correct and precise localization. In the other 10 per cent. air or lipiodol injections will supply the diagnosis and localization. Laminectomies are not warranted until localization is positive. Spinal fluid study is rarely essential; lumbar puncture alone is objectionable on account of the frequent

loss of sphincter, motor and sensory function following it, and Queckenstedt's test proved unreliable in the writer's experience. Lipiodol is used for localization when a tumor is known to be present and when other means fail; it always locates a tumor with absolute precision, and can be removed at the operation. Air is advantageous in being quickly absorbed, but its shadow is far less sharp in localizing the tumor. Lumbar puncture is necessary for air injections, while Ayer's cisternal puncture is far superior for the lipiodol test.

### SPINE.—ABNORMALITIES.—

A clinical picture characterized by sciatic pain usually combined with some deviation of the spine, and due to abnormality of the transverse processes of the 5th lumbar vertebra is discussed by B. H. Moore (Jour. of Bone and Joint Surg., Apr., 1923). There is less general rigidity of the spine than in lower lumbar arthritis, and more localized limitation at the lumbosacral junction. Several Roentgenograms should be made at varying angles to ascertain thoroughly the relations of the abnormal transverse process to the sacrum and ilium. The list of the spine is apparently an attempt to draw the process away from the ilium.

The treatment in the writer's 9 cases consisted of amputation of the affected transverse processes followed by back-bending exercises as soon as these could be performed with comfort. The pain was relieved and motion of the spine improved. No plaster or braces were used. H. Martius (Zent. f. Gyn., July 19, 1924) refers to unilateral sacralization of the 5th lumbar vertebra as a rare cause of refractory

pains in the back. X-ray treatment or a tight corset have been recommended for these cases. Operation is difficult, but has been performed with success by Garré.

INJURIES.—According to L. W. Rork (Jour. of Radiol., Sept., 1924), stereoscopic examinations show a surprisingly large number of partial displacements of the articular processes at the point of spinal injury. Differentiation between a recent injury and an early tuberculous involvement is readily obtained if the typical nonbone-producing involvement of the articular surfaces can be determined. Not uncommon is spondylitis with a history of a slight trauma and brief disability, with no apparent X-ray evidence of injury. The patient often resumes his work for a time and then gradually a complete disability develops. A routine X-ray examination should be made of every spinal injury, fortified by stereoscopic plates. If no evidence of disease or injury can be elicited in the tract itself, the presence of focal infection should be suspected.

TUBERCULOSIS (POTT'S DIS-EASE).—The results obtained in 35 cases in Denver, Colo., by a combination of Rollier's heliotherapy with hygienic and postural treatment are described by E. H. Bruns (Amer. Rev. of Tub., Oct., 1924). Of the series, 6 are apparently cured, 6 arrested, 28 improved, 3 unimproved, and 2 dead. The treatment calls for rest in bed for 2 years and hospitalization for 3 years, but the patients usually become enthusiastic over the sun treatment and cooperate well. Schooling is provided for the children and various occupations and games for adults. In 8 cases there were

multiple fistulas; these were irrigated with 1:1000 mercurochrome or gentian violet solution or treated by injection of stronger solutions of these dyes or with iodoform emulsion. In all but 2 there was decided improvement. In 8 out of the 18 cases of psoas abscess, the abscess was aspirated and injected with iodoform emulsion, beginning with 5 c.c. (80 minims) and increasing by 2 c.c. (32 minims) a day to the point of tolerance, 3 being apparently cured, 2 arrested and 3 decidedly improved.

Hibbs's spine fusion operation is preferred to the tibial bone graft method of Albee by R. F. Sullivan (Boston Med. and Surg. Jour., July 17, 1924), as it requires but 1 wound, less skill, and obtains fusion of every vertebra at 5 points instead of only 1. In Albee's method there is always the danger that the graft will not take. There were no deaths attributable to the operation of spine fusion in over 700 cases. Solid bony fusion is obtainable by it even in very young children. A Taylor back-brace is applied on the operating table, and recumbency maintained for 8 weeks; after this, standing and walking are allowed. In 6 months all apparatus can be discarded by adults, while children should wear protection for about a year. Of 373 cases examined by Hibbs, 75 per cent. show a definite cure by the operation; 5 per cent., doubtful cure; 3 per cent., no improvement, and 17 per cent., death, mostly from acute infections such as influenza and whooping-cough.

Schultz having suggested a modification of Albee's operation for application to the *lumbar spine*, F. Smoler (Casop. lek. cesk., Oct. 4, 1924) employed the method in 2 such cases, with satisfactory results, and strongly recommends it as affording better fixation than a corset. In this procedure 2 bridge spans are used, supported above on the spine of the upper vertebra and below on the crest of the ilium. The 2 patients were 13 and 19 years of age and had caries of the 4th and 5th and 3d and 4th lumbar vertebræ, respectively. Pain was relieved and the general condition much improved by the operation.

A method termed osteosynthesis after slow redressement is advocated by H. Waldenström (Zeit. f. orth. Chir., May 17, 1924). The kyphosis is 1st gradually and completely reduced by pressure in Lorenz's plaster bed with cotton padding, and this is followed by fixation of the spine with an Albee tibial transplant. The operation is not performed until the process has come to a standstill—6 months after onset-and only provided 2 or more vertebræ are involved; otherwise, the corset suffices. Nor is the operation done in weak or fistulous patients or children below 4 or 5 years of age. After-treatment consists of recumbency in a plaster bed with continued pad redressement for 2 or 3 months, followed by a plaster corset and compression with cotton pads for a like period. Lastly, a cloth corset with steel stays is used for 1 year or more. General treatment with sunshine, fresh air and good food is also employed through-From these measures the writer reports 80 per cent. of recoveries with straight back and good function among 101 cases.

SPLEEN.—FUNCTIONS.—According to W. De P. Inlow (Amer. Jour. Med. Sci., Jan., 1924), there is probably a normal cyclic variation in the output of bile pigment, and the spleen exercises a regulatory influence in this connection. In dogs with biliary fistulas, splenectomy was found to

cause an increase in the amount of bile secretion when food was given by ½ above the amount secreted under similar conditions before splenectomy. Fluctuations in the amount of bile were more marked. The amount of bile acid remained about the same. The curve of bilirubin output resembled that of the hemoglobin percentage, but the fluctuations in the output of bile pigment were much more marked. Apparently the factor or factors responsible for the blood picture after splenectomy are responsible also for the reaction in the secretion of bile pigment after the operation.

M. Castex (Bull. Soc. méd. des hôp. de Paris, Feb. 28, 1924) maintains that the spleen exerts an influence on the secretion of trypsin by the pancreas. In a chronic case of malaria with signs of syphilis, a marked creatorrhea was found, which, while not influenced by antisyphilitic treatment, disappeared after daily hypodermic injections of a splenic extract. The creatorrhea recurred each time the injections were stopped and passed off again on their resumption. In another similar case, the same phenomenon was observed.

SPLENIC ANEMIA.—According to W. J. Mayo (Jour. Amer. Med. Assoc., Sept. 13, 1924), the term "splenic anemia" in itself indicates, not an entity, but a syndrome which may be due to many causes. In 98 cases in which splenectomy was done for splenic anemia at the Mavo Clinic, microörganisms were not secured on culture, yet the condition of the spleen was such as to give the impression that the disease is the result of infection by bacteria which have been destroyed. In the later stages, the liver is often involved in the portal cirrhosis described by Banti. Splenectomy in such cases may not only save the patient's life but restore him to usefulness. mortality of 10 per cent., almost entirely confined to cases in the terminal stages with liver involvement, is to be expected.

Of 9 cases of "syphilitic splenic anemia" treated by splenectomy, all were in the advanced stages of syphilis and had been thoroughly treated without cure; several had gummas in the liver as well as the spleen. One patient died, but 8 were cured, all evidences of the syphilis and the anemia disappearing in a few weeks, though little or no after-treatment was given.

**SPRUE,**—From researches concerning the rôle of *Monilia psilosis* (Ashfordi) in experimental sprue, L. W. Smith (Jour. Amer. Med. Assoc., Nov. 15, 1924) is led to favor the view that *M. psilosis* is the agent responsible for the symptoms in this disease.

According to the findings in autopsies by P. Manson-Bahr (Lancet, June 7, 1924) in 2 rapidly fatal cases, the essential anatomic lesion in sprue appears to be an ulceration of the small intestine which, if it continues long enough, leads to a complete atrophy of the villi, such as is observed in the chronic stage of the disease. The milder case showed 1 ulcer in the ileum, 1 inch in diameter, which had perforated in 2 places, while in the more severe case, 12 ulcers in the ileum were found, all perforated.

In areas where sprue is endemic conditions are such, according to H. H. Scott (Brit. Med. Jour., Dec. 15, 1923), as to produce an excessive protein or fatty diet. Where fats are in excess there is excessive excretion of calcium in addition to intoxication of intestinal origin; in the other cases, the protein excess is likewise attended with intestinal toxin forma-

tion. In both groups the parathyroid detoxicating function is overburdened, with a resulting disorganization of its calcium-regulating function, while there may in addition be diminished calcium absorption. The writer has obtained definite results in sprue by combined treatment with calcium lactate and parathyroid extract.

The plan of treatment Scott recommends (Lancet, Mar. 21, 1925) is as follows: The patient is put to bed for the 1st 14 days and given only milk, beginning with 3½ to 4 pints a day, taken warm with a teaspoon at regular intervals, and increasing by 1/2 pint a day, till at the end of a fortnight 7 to 71/2 pints are taken daily. Calcium lactate is given in cachets containing 15 grains (1 Gm.) each, thrice daily, and parathyroid extract,  $\frac{1}{10}$  grain (0.0065 Gm.) twice daily. This extract must be free from thyroid. For constipation, a small dose of liquid paraffin is probably best. From the 10th day on, some plain biscuits may be allowed, and later a gradual increase of diet. The patient may be permitted to be up for an increasing time each day. After 3 weeks, unless a very severe or longstanding case, the patient can take milk puddings, eggs, fish, potato, carrot, bananas, and in the 4th week, chicken and non-acid fruits. The calcium can be reduced in the 3d to 4th week and probably stopped at the end of the 4th. The parathyroid is continued till the 5th week, next reduced to 1/2 doses for a week, and then further reduced and stopped after 6 to 7 weeks. This, however. can be gauged with certainty only by the blood test, the drug being continued until the ionic calcium has reached normal (10.4 to 11.4 mgm.

per 100 c.c., while in severe sprue the calcium falls to 6.5 mgm.). Weekly calcium determinations throughout the treatment are advised. With this treatment a rapid and—so far as can be judged as yet—permanent cure results in cases of sprue taken in hand early, in marked contrast to the temporary improvement and risk of relapses and even death following the older empiric methods of treatment.

STERILITY,-Tubal insufflation is recommended by S. R. Meaker (Boston Med. and Surg. Jour., Feb. 21, 1924) both for diagnostic and therapeutic purposes. In 15 per cent. of cases of sterility the cause is an abnormality of the tubes. If pneumo-peritoneum results from the insufflation, at least 1 tube is shown to be patent. Negative results indicate definitely a tubal factor. The X-ray may be used as auxiliary in doubtful cases. The flow of gas must be very slow at first, to obviate uterine colic, which may offer resistance. In positive cases there is usually a sharp drop of pressure from 60 to 100 mm. Hg down to 20 to 50 mm. Other positive evidences are auscultatory signs and subjective symptoms. In the absence of these, and if the pressure remains at 200 mm. for 3 minutes, the test is proven negative. The writer advises against laparotomy, however, until 6 careful insufflations have been negative. The therapeutic value of insufflation is definitely established. Its possibilities are especially great when the gas passes through with some difficulty. As the writer notes elsewhere (Jour. Amer. Med. Assoc., June 28, 1924), repeated attempts at insufflation often result

in the tubes becoming permeable to gas, and sometimes in conception. Suspecting that spasm of the tubes might account for their resistance, the writer gave benzyl benzoate in the 20 per cent. alcoholic solution to 5 cases previous to insufflation, with uniformly successful results. In 2 of the cases the dosage was 5 drops hourly for 6 hours before the insufflation. He also suggests that patients thus treated take a large dose, such as 60 drops, before coitus, and then, to maintain the relaxation, 30-drop doses every hour for 3 doses and after this, every 2 hours for 3 doses.

In a case reported by Caufmann (Zent. f. Gyn., Oct. 25, 1924), adiposity and amenorrhea having suggested ovarian insufficiency as the cause of sterility, weak, stimulating doses of the X-ray were applied over 1 ovary, then the other on the next day. The 2 exposures, consisting of only 12 per cent. of a skin dose, proved sufficient for a cure.

In cases in which spasm of the uterus prevents conception, M. Nassauer (Münch. med. Woch., Feb. 9, 1923) has had good results in several instances from the insertion of a tube in the cervix.

According to Cunéo (Médecine, Apr., 1923), the best surgical procedure where sterility is due to occlusion of the fimbriæ is ovariosalpingorrhaphy, i.e., the use of the ovary to keep the tube patent.

#### STOMACH.—DIAGNOSIS.—

X-rays.—According to A. Henriques (New Orl. Med. and Surg. Jour., Feb., 1924), the X-ray makes it possible to determine the presence of 90 to 95 per cent. of organic lesions of the stomach and duodenum, and the percentage of negative diagnoses is equally high. Much erroneous treatment can thus be avoided where these organs are not at fault, while, on the other hand, many so-called chronic dyspeptics can be given surgical relief. Fluoroscopy is applied by

the writer in the following routine order: Chest, esophagus, fundus of stomach, median portion, pyloric antrum, pylorus, and duodenum. It permits examination from many angles. Palpable masses can be related to filling defects; many spasms may be overcome, especially about the pyloric antrum, and the flexibility of the walls, which is an important sign in early malignancy, can be determined.

A standing position of the patient in X-ray examination of the pyloric and duodenal region is favored by J. Schütze (Fort. a. d. Geb. d. Röntgenstr., Jan., 1924), as he can be moved about more readily. This entails some delay, however, until the required evacuation of the stomach begins. To hasten matters at this juncture, the writer finds it useful to apply the right hand in the region of the angular incisure and make pressure in the direction of the antrum. The pylorus usually quickly opens thereafter, thus assisting in the distinction between a spasm and an actual anatomic constriction or distortion. The opening of the pylorus in this maneuver seems to be due merely to the mechanical increase of pressure in the stomach, although reflex centers might also be concerned.

For a long time the presence of a permanent, non-displaceable niche on X-ray examination has been considered a sufficient indication that a gastric ulcer is positively present. A. Bassler and J. R. Lutz (Amer. Jour. of Roentgenol., Jan., 1924), however, report having seen a number of cases in which, after the observation of a niche, no ulcer was found present at operation, and do not favor a diagnosis of ulcer on this finding alone without the presence of symptoms of ulcer or persistent gastric trouble.

Gastroscopy.—This procedure is interpreted by W. Sternberg (Deut. Zeit. f. Chir., Jan., 1924) as an application of the principle of cystoscopy to internal inspection of the stomach wall. After thorough lubrication with large amounts of a lubricant of agreeable taste, he 1st introduces 1 or more ureteral catheters or duodenal sounds into the stomach and, after further lubrication, follows these with the gastroscope, which, constructed like a cystoscope, permits of its introduction under visual control through inspection of the esophageal wall. Passage of the hiatus and cardia

is thus rendered easier and safer. It is even possible to palpate, evacuate or catheterize the duodenum under visual control.

Gastroscopy proved diagnostically serviceable in the hands of Schindler (Arch. of Int. Med., Oct., 1923) in the diagnosis of 26 malignant and 4 benign gastric tumors. In fact, in 3 cases an early diagnosis of cancer, while it was still operable, was thus made possible. Carcinoma presents a varied picture, the common form being a rigid infiltration of the stomach wall with small shallow ulcerations or rounded tumors with crater-like ulcerations. The base may be of a vivid yellow or gray-red, though more often showing the appearances of necrosis, with brown, violet, red, vellow, white and even green discoloration. Rahnenführer (Fort. a. d. Geb. d. Röntg., xxxii, 21, 1924) comments on the value of gastroscopy in establishing the diagnosis of gastric ulcer when other methods have failed; overestimation of negative gastroscopic findings should, however, be guarded against. In several cases he was able to trace pylorospasm to small ulcers on the lesser curvature which had remained undetected.

According to Hammesfahr (Zent. f. Chir., Feb. 9, 1924), gastroscopy and exploratory laparotomy should supplement each other. The former throws no light on perigastric adhesions, duodenal ulcers or conditions of the biliary tract. On the other hand, not a few gastric ulcers are overlooked during exploratory laparotomy, while perigastric adhesions may simulate an ulcer and lead to resection. During the laparotomy a short gastroscope may with advantage be introduced through a small slit in the stomach to check and add to the findings on palpation.

Fractional Analysis.—This method of gastric analysis was applied by D. Hunter (Quart. Jour. of Med., Jan., 1923) in 270 cases. Of 15 cases of gastric cancer, in 67 per cent. the curves showed complete achlorhydria. Macroscopic blood appeared in 27 per cent. of the cases, of which ½ were operable. In a great variety of conditions there occurred a complete achlorhydria, and the specimens were scanty, difficult to withdraw, and mixed with mucus. Such findings were invariably associated with rapid emptying. They were

present in the majority of cases of visceroptosis, pernicious anemia and hepatic cirrhosis. In myeloid leukemia, acne rosacea and lupus erythematosus there was a low hypochlorhydria. A prolonged secondary anemia, such as may result from repeated small hemorrhages from a duodenal ulcer, may cause achlorhydria, which, furthermore, may persist after return of the blood condition to normal.

In fractional analyses by J. Friedenwald, W. H. Gantt and T. H. Morrison (Ann. of Clin. Med., Mar., 1924), the conclusion was reached that the stomach contents obtained by means of the ordinary test meal is not a homogeneous mixture, since fractions aspirated in rapid succession through the Rehfuss tube show more or less marked variations in acidity. These variations may be largely reduced, however, by mixing the contents and rapidly aspirating; this procedure must be used in all examinations requiring accurate information regarding the entire contents. Moderate daily variations in acidity occur, though a hyperacid, normal or hypoacid secretion continues to present, as a rule, the same character of acidity. The tube and its tip have practically no effect on the secretion of acid. The acidity is not ordinarily influenced by the Sippy treatment in ulcer, even though the patient show evident improvement.

Test Meals.—In examination of the stomach contents for hyperacidity, Boas (Med. Klin., Nov. 25, 1923) uses a test meal consisting of a plate of soup with an egg, 200 Gm. of mashed potato prepared with milk and butter, 1 roll, and a glass of water. The gastric contents are withdrawn only after 3 hours. The writer stresses the advantages of such a test meal over a test breakfast.

According to L. Ponticaccia (Gior. di clin. med., June 10, 1924), the following is the most convenient and advantageous technic for fractional extraction with the Einhorn tube: The patient chews for 5 minutes, but does not swallow, a piece of chop fried in butter, then takes 300 c.c. of lean beef broth. The tube is passed into the stomach 15 minutes later, with the patient in the sitting posture. He then reclines on his left side, and extractions are made every 20 minutes for 2½ hours or longer by means of a large syringe adapted

to the outer end of the tube, the product of each extraction being received in a separate test-tube.

Acidity Tests.—Sahli (Schweiz. med. Woch., Jan. 3, 1924) recommends the following method of determining the free acidity in preference to determination by ordinary titration procedures, which are vitiated in this connection by dissociation of acid bound loosely to the proteins: To 10 c.c. of filtered gastric juice is added 0.5 c.c. of a dilute solution of methyl violet. To 10 c.c. of distilled water in another test-tube of the same caliber is added likewise 0.5 c.c. of methyl violet solution, and decinormal HCl is then further added until the color matches that of the 1st tube. A 3d tube, filled with the filtered contents and held in front of the 2d tube, facilitates the comparison. To avoid error from overdilution of the indicator, normal HCl is substituted if the acidity is too great. For titration of very low acidities, litmus is preferable to the methyl violet.

A simple, bedside method for estimation of the free acidity, to replace the customary titrations of the gastric contents, is described by W. Denis and D. N. Silverman (Amer. Jour. Med. Sci., Jan., 1925). The procedure consists merely of bringing 2 kinds of test paper in contact with the gastric juice, the acidity of which is accurately shown by the color changes of 1 or the other of the test papers. The latter are easily prepared with any high-grade ashfree filter paper. One sheet of it is moistened with a solution of 0.5 per cent. dimethylaminoazobenzol (Töpfer's reagent) in 95 per cent. alcohol, and the other, with 0.1 per cent. thymol blue, likewise in alcohol. The papers are quickly dried in front of an electric fan and cut into the usual small strips. The Töpfer's reagent covers the range of acidity from pH 1.0 to pH 2.0, and the thymol blue, from pH 2.0 to pH 3.0. The colors observed and their significance in terms of normal, hyper- or hypoacidity are as follows: Töpfer's reagent: Deep red, hyperacidity; reddish-orange or orange, normal acidity; yellowish-orange, hypo-Thymol blue: Purple-red, hypoacidity. acidity; faint pink, more marked hypoacidity; yellow, anacidity.

Forestier and Loeper (Prog. méd., July 28, 1923) estimate the secretory activity of the

stomach by giving capsules of *lipiodol* and observing with the X-ray the time required for them to be digested and disseminate their opaque contents. The capsules are of 1 c.c. each and are made from a mixture of gelatin, glycerin, cane sugar and water. Normally the opaque material escapes in 16 to 18 minutes. The time of rupture varies directly with the total HCl in the stomach.

Where passage of a stomach tube is contraindicated, J. Holó and S. Weiss (Klin. Woch., Feb. 26, 1924) obtain information as to the HCl secretion by determining the alveolar carbon dioxide tension after a test meal. The secretion of gastic juice is known to produce alkalinization of the blood, which results in depression of the respiratory center and consequently a rise of CO2 tension in the lungs. In anacidity, the writers observed a gradual fall of CO2 tension instead of a rise after meals. The maximum CO2 tension after a meal is usually reached in 30 minutes. In hyperacidity there is a greater rise than normal, and also a more prompt and rapid reaction. The writers use a simple but accurate colorimetric method for the CO2 tension determination.

Chromodiagnosis.—This consists in the intramuscular injection of a dye and observation of the time of its excretion into the stomach. According to P. Saxl and D. Scherf (Wien. klin. Woch., Sept. 20, 1923), only fat-soluble dyes, such as methylene blue and neutral red, are thus eliminated. K. Glässner and H. Wittgenstein (Ibid., Nov. 8, 1923) inject 4 c.c. of 1 per cent. neutral red solution into the buttock in the fasting subject, and find that normally the dye appears in the stomach in 12 to 15 minutes; in hypersecretion of acid, in 8 minutes or even earlier, and in hypoacidity, in 25 to 45 minutes or more. In achylia there was no elimination of dye even after 1½ hours. J. Koopman (Ann. de méd., June, 1924) observed an interval before neutral red excretion of 40 to 60 minutes in 8 cases of pernicious anemia and several of cancer or chronic gastritis. In gastric ulcer or neurosis with hyperchlorhydria, it ranged from 41/2 to 12 minutes.

Lactic Acid.—Where, as is often the case, Uffelmann's test for lactic acid is not sufficiently delicate, Boas (Arch. f. Verd., June, 1924) uses the test previously described by Fletcher and Hopkins for lactic acid in the

urine. To 5 c.c. of concentrated sulphuric acid are added 1 drop of saturated copper sulphate solution and 2 drops of filtered gastric juice. The test-tube is held in a boiling water-bath for 1 to 2 minutes, then quickly cooled. Three drops of thiophen solution—10 to 20 drops in 100 c.c. of alcohol—are now added, and the tube again immersed in boiling water for 1 minute. If lactic acid is present in large amount, a cherry-red zone results; if in smaller amount, mahogany brown; if absent, yellow or yellowish brown. This test is positive with 1:2000 of lactic acid in pure solution.

Chlorides.—A test meal of 300 c.c. of 5 per cent. alcohol is used by Woenckhaus (Zeit. f. klin. Med., May 15, 1924) for the determination of chlorides in the stomach. In normal persons rather constant results are obtained, the average being 0.11 per cent. In ulcers, the average was 0.2 per cent., while in cancer and pernicious anemia, readings within a low normal range, viz., 0.09 to 0.1 per cent., were obtained. The results are vitiated by the presence of bile.

Blood.—L. Meunier (Arch. des mal. de l'app. dig., Jan., 1923) distinguishes between fresh and digested blood in the stomach or feces through the fact that the hemoglobin of the former is soluble in water, whereas the hematin from digested blood requires ammonia for its dissolution. The phenolphthalein test for peroxydases is carried out with the extracts thus obtained.

CANCER.—DIAGNOSIS.—According to E. Schütz (Wien. klin. Woch., Aug. 7, 1924), a diagnosis of gastric carcinoma is justified, even in the absence of other objective signs, when anacidity and an abundant bacterial flora of long or short rods can be demonstrated in the gastric contents. Such findings, especially if there are also signs of stenosis of the pylorus, render a diagnosis possible in an early stage of the disease, as illustrated in a case of the writer's in which, at operation, neither infiltrations, adhesions nor metastases were

found around the growth. On the other hand, even a palpable tumor with anacidity does not justify a diagnosis of cancer, since this combination can occur in gastric ulcer.

In spite of the fact that the cancerous stomach remains the sole focus of the disease for a considerable time, D. Cheever (Boston Med. and Surg. Jour., Mar. 6, 1924) states that out of 236 hospital cases, radical operation could be attempted only in 9.7 per cent., although in over 1/2 the duration of symptoms before admission had been less than 6 months. In a person previously digesting normally, the slightest symptom-complex embracing such complaints as belching, distress after eating, loss of appetite, nausea, debility, pallor and constipation, persisting for any length of time, should occasion the most careful diagnostic measures. From fluoroscopy after an opaque meal dependable evidence is obtained in 97 per cent. of cases.

The chief diagnostic aids, according to W. Anschütz (Münch. med. Woch., Jan. 2, 1925) are occult bleeding and the X-ray. If both are negative, laparotomy serves no purpose. Even an early cancer is improbable if occult bleeding is repeatedly found wanting.

H. Schlesinger (Mitt. a d. Grenz. d. Med. u. Chir., xxxviii, 8, 1924) emphasizes the possibility of latent cancer in old patients with temporary spasm of the esophagus, especially in its upper ½. He found this the 1st sign of the disease in 4 cases and a very early sign in a 5th. The condition interfered with deglutition, even of fluids. In 1 instance it persisted for 5 weeks, and the cancer was not detected until 6 months later. He ascribes the

symptoms to a pyloro-esophageal reflex, the irritation of the vagus fibers in the stomach wall causing increased irritability of the esophageal distribution of the same nerve.

H. Wiener (Arch. f. Verd., Jan., 1923) endorses Reissner's conclusion that a high total chlorine (0.34 to 0.58 per cent.) with low acidity of the gastric contents points to malignant disease and is evidence against simple achylia, in which the chlorine proved to be but 0.03 to 0.14 per cent. Eosinophile cells in the gastric contents justify, according to Grote (Klin. Woch., Apr. 29, 1924), a suspicion of cancer.

F. Ramond, Ravina and Zizine (Bull. Soc. méd. des hôp. de Paris, June 22, 1923) describe a cytolytic test. The serum of cases of gastric cancer and to a less extent, of cancer lower in the digestive canal, rapidly destroys the cells in a suspension of scrapings of gastric mucosa from the human subject or dog. Upon centrifugation of an extract of gastric cells, tubes to which the cancer serum is added become clear on incubation for 24 hours, whereas controls become more cloudy. Aside from early diagnosis, these 2 tests are also of some prognostic service, intense cytolysis pointing to marked resisting powers and a slower course of the disease.

Where rectal metastasis can be detected along with signs of gastric cancer, Bensaude, Cain and Oury (Bull. Soc. méd. des hôp. de Paris, Nov. 16, 1923) strongly suspect a linitis plastica of the stomach with multiple metastases along the intestinal tract. Some cases of linitis can thus be diagnosed during life.

TREATMENT. — Treatment by drugs is of slight value, as noted by J. Sailer (Atlantic Med. Jour., Sept., 1924), yet should not be neglected. Hydrochloric acid should be tried in achylia cases and continued while it gives relief. Condurango—still the

best stomachic-nux vomica and gentian help at most a few days or weeks. Orthoform and phenol often allay pain. Morphine is alone certain to comfort the patient. It is indicated in pain, sleeplessness and excessive fear, and should not be stinted. Radiotherapy has proven ineffective for curative purposes, but radium serves to relieve dysphagia in some cases of esophageal obstruction. Gastric lavage has been largely superseded by early operation for the relief of pyloric obstruction. Two cases are described which, while probably not carcinomas, illustrate the value of operation at times even in cases considered hopeless. Pedrajas (Prensa med. Argent., Oct. 10, 1924) stresses the value of repeated gastric lavage for the relief of suffering in inoperable cases. A little milk with meat powder may be introduced when the fluid comes back clear. Saline proctoclysis may advantageously follow the lavage.

In regard to surgical treatment, Anschütz (loc. cit.) states that gastroenterostomy seldom prolongs life more than 3 months, and he employs it only in cases with extensive metastases and severe motor insufficiency. In general, all cases free of large distant metastases should be treated by resection. Cachexia, anemia, old age and inanition are not contraindications. Even when small metastases have to be left in the glands, peritoneum, etc., palliative resection may retard the growth for years. Portions of the liver, pancreas or spleen may be removed if involved. In a recent 4-year period, resection was performed in 48 per cent. of all cases operated, with a mortality of 25 per cent. Of those who survived the

operation, 38 per cent. were alive 2 years later, including 21 per cent. who lived 10 years or more. In the clinical prognosis, the history, extent of tumor and histopathologic findings proved unreliable; the location seemed of greater importance, the pyloric growths giving relatively poor ultimate results.

Among cases of localized cancer, H. Finsterer (Wien. klin. Woch., Nov. 13, 1924), after resection, had 40 per cent. free of recurrence after 3 years and 31 per cent. after 5 years. Even in liver or pancreas involvement, 26 cases were well after 5 to 13 years. The mortality of exploratory laparotomy in early cases is low, though where this operation was done to determine the possibility of resection, the mortality was 10 to 20 per cent.

The same observer (Arch. f. klin. Chir., Sept. 23, 1924) discusses the surgical treatment of carcinoma on an ulcer basis, which, he believes, occurs often enough to require consideration, in the indications for operation, of the choice between gastroenterostomy and resection. Hitherto the results in such cases have been poor. He advocates resection for all chronic ulcers, particularly when callous and penetrating. If they are not yet degenerated and if the resection includes at least \( \frac{2}{3} \) of the stomach, the procedure becomes a prophylactic operation against cancer. Of 32 cases operated by the writer for ulcer carcinoma, only 2 died of the operation. Of 21 definitely known cases of ulcer carcinoma, however, only 6 were living 21/2 years or longer after the operation.

A case of successful total gastrectomy for a cancer situated close to the cardia is reported by Schüppel (Deut.

Zeit. f. Chir., May, 1924). The jejunum was anastomosed by end-to-side suture to the stump of the esophagus, the duodenum then joined to the jejunum, and finally the stomach and pyloric region removed. During the operation, which lasted 2 hours, nourishment was given through a jejunal fistula.

Records of 80 cases are presented by H. R. Hartman (Jour. Amer. Med. Assoc., Dec. 20, 1924), tending to show that a patient with a resectable carcinoma and anacidity (as determined by the fractional aspiration method) has a 44 per cent. chance of at least 5 years of postoperative life, and has twice the chance of a patient whose stomach contents show free HCl.

According to C. R. Robins (Va. Med. Mthly., Apr., 1923), the X-rays hold great possibilities as an adjuvant to operations for gastric cancer. In a case he reports gastroenterostomy performed for temporary relief was followed by distress and vomiting. From the 1st X-ray treatment the general condition began to improve, and the patient was comfortable for 15 months, dying then of cancer of the liver.

In 2 cases with severe hemorrhages, reported by Gmelin (Deut. Zeit. f. Chir., Oct., 1924), the large size of the presumed cancers appeared to contraindicate operation, but intervention revealed gastric *myomas*, upon **resection** of which the patients were fully restored.

"CLAUDICATION."—F. Ramond (Médecine, July, 1923) recognizes a condition of intermittent closure of the gastric vessels analogous to that giving rise to intermittent claudication of the legs. The cause may be a sympathetic vasomotor disturbance,

gout, syphilis or lead poisoning. In the event of sympathetic derangement, violent pulsation of the abdominal aorta may usually be found, together with indications of a neurosis and of visceroptosis. The distress and pain, appearing 2 or 3 hours after eating, are usually promptly relieved by vomiting. The diagnostic features are, mainly, the patient's age, a tendency to atheroma, the severe pain, absence of much gastric dilatation, failure of alkalies to relieve, and the harmful effects of fat soups, cold drinks and meat. The treatment consists of rest during the digestive period, a milk-vegetable diet, and, for the painful attacks themselves, warm drinks, 1 tablespoonful of liquid petrolatum and very hot compresses to the epigastrium, perhaps supplemented by 0.5 mgm. ( $\frac{1}{130}$  grain) of atropine sulphate hypodermically or by tentative treatment for syphilis.

DILATATION.—In patients with severe motor insufficiency and dilatation of the stomach, K. Klein (Casop. lek. cesk., May 13, 1924), on the basis of very favorable results, advises treatment by systematic lavages of the stomach and a careful diet for 3 weeks, unless evidences of cancer exist.

Leven (Arch. des mal. de l'app. dig., Mar., 1924) notes that many cases of gastric dilatation are attended with clinical and X-ray indications of ulcer, and are treated by operation. The latter may frequently be avoided, he finds, by giving sodium bromide and following it with iodized oil and mercurial suppositories.

In gastroplication for chronically enlarged stomach, as stated by W. Dreifuss (Arch. f. klin. Chir., May 10, 1924), the thick folds projecting

within may hinder gastric functioning. The writer endorses Rehn's procedure of excising 1 or 2 crescents or oval portions of stomach wall down to the submucosa only, the mucous membrane being allowed to remain intact and the thick outer layers sutured. Good results followed this operation in 2 cases.

**FLATULENCE.**—According to F. W. Palfrey (Boston Med. and Surg. Jour., May 24, 1923), the distress ascribed to "gas in the stomach" is due mostly to air, gas caused by fermentation seldom occurring in large amount. He attributes the distress to failure of the act of belching to maintain a proper adjustment of intragastric pressure. He orders a small-bulk dry diet in 6 meals a day instead of 3, and with liquids, except in minimal amounts, only between meals. Irritants and foods hard to masticate are avoided, as well as any foods known to be deleterious. Carminatives are avoided. Where hyperacidity is a factor, milk of magnesia or magnesium oxide in some form usually benefits; if not, sodium bicarbonate, well diluted, is used. Bile preparations are also useful to reduce the need for these drugs. In disturbed motility, atropine,  $\frac{1}{150}$ to  $\frac{1}{100}$  grain (0.0004 to 0.00065 Gm.) 3 times a day, may benefit. In obstinate cases, latent appendix or gallbladder disease should be thought of.

In meteorism due to abnormal fermentation in the stomach and intestine, G. Hayem (Bull. de l'Acad. de méd., Nov. 6, 1923) favors gastric lavage, reduction of carbohydrates, and kaolin, 10 Gm. (2½ drams) 3 times daily.

HYPERSECRETION.—According to A. J. Carlson (Phys. Rev., Jan.,

1923), the rôle of the gastric juice in the maintenance of health and the etiology of disease has been exaggerated, to the neglect of the importance of gastric motility. There is no disease known capable of inducing true gastric hyperacidity; the pathologic deviations in acid and pepsin concentrations are invariably in the direction of a decrease. The factors definitely known to induce hypersecretion are delayed evacuation from pyloric obstruction and gastric stasis due to factors that do not at the same time depress the gastric glands. The gastric juice can itself produce disorders only when it acts on tissue or mechanisms that are already Elsewhere, Carlson pathologic. (Minn. Med., Feb., 1923) states that the pain of ulcer is often present in complete anacidity, and pyloric spasm is an important element in its etiology. Inhibition of the stomach contractions follows the introduction of any material whatever-foods, hot or cold water, acids or alkalies-and is therefore 1 factor in the control of ulcer pain.

A. O. Haneborg (Norsk Mag. f. Laeg., June, 1924) agrees that many cases of so-called hypersecretion are merely cases of retention due either to obstruction or to faulty motility of nervous origin. The aim in treatment should be to ward off or correct these conditions. As long as the stomach is regularly evacuated, even hypersecretion does no harm. The action of bitter tonics, according to the author's research, seems to lie almost exclusively in promotion of peristalsis in the pyloric region.

Hyperacidity is not a simple disorder of the stomach, according to Molnar and Csaki (Zeit. f. klin. Med., May 15, 1924), but represents a general disturbance of sodium chloride metabolism. Sodium chloride elimination was found markedly retarded in patients with hyperacidity, and likewise in patients with hyperacid complaints but normal or low gastric acidity. In the treatment, a diet low in sodium chloride is indicated, having a favorable influence on the meta-Novatropine or bolic disturbance. sodium bicarbonate in small doses only-1 mgm. (1/65 grain) twice daily or 1 to 1.5 Gm. (15 to 23 grains) 3 times daily, respectively—not only benefit hyperacid complaints but promote salt excretion, whereas large doses have an opposite effect. Thyroid preparations were found to abolish the sodium chloride retention.

> According to Földes (Klin. Woch., Oct. 21, 1924), "hyperacidemia" is the condition underlying hyperacidity. It causes retention of chlorides. The socalled hyperacidity pains are due to contractions of the stomach which is trying to overcome pyloric spasm, and are relieved by inducing secretion, because relaxation of the pylorus occurs at the same time. Either induction of secretion by means of alkali or ingestion of food or relaxation of the pylorus with atropine or papaverine will bring relief. He looks upon Sippy's diet as relieving pain by causing an almost constant secretion.

T. J. Bennett (Brit. Med. Jour., Mar. 3, 1923) states that for reducing gastric secretion atropine is an effective drug, especially if given in small doses and in a large volume of water on an empty stomach. Sodium bicarbonate tends to excite secretion, and this more than counterbalances its neutralizing effect. Magnesium oxide and bismuth subcarbonate are far less stimulating and possess greater neutralizing

power. Atropine delays gastric evacuation.

Some cases of periodic painful hyperacidity have been promptly relieved, in the experience of J. Kaufmann (Amer. Jour. Med. Sci., July, 1923), by a teaspoonful of a 20 per cent. solution of crystallized calcium chloride in distilled water, to be taken in ½ tumbler of water in the course of the principal meals. For prophylactic purposes he advises those subject to periodic hyperacidity or active ulceration to continue the calcium over a course of months.

Bassler (Amer. Jour. of Electroth., May, 1924) states that not a few cases of intractable hyperacidity have had marked subjective benefit from X-ray treatments.

Cholecystectomy was performed by De Takats (Surg., Gyn. and Obst., Feb., 1925) in 2 cases of "essential" hyperacidity with marked symptoms, after other measures had failed. In both cases prolonged relief was obtained. The gall-bladders appeared atonic.

HYPOSECRETION. - From an analysis of the symptoms in 100 cases of achylia gastrica observed in private practice, B. W. Fontaine (South. Med. Jour., July, 1924) concluded that while loss of weight and strength, pain and tenderness, cramping and abdominal discomfort, accompanied by low blood-pressure, are frequently present, they alone are not diagnostic. In 21 per cent. of the cases absolute achylia existed in the absence of any single symptom referable to the gastrointestinal tract. The diagnosis of achylia is absolutely dependent upon an analysis of the gastric contents after a test meal. Complete achylia should always be confirmed by fractional analysis.

According to Adlersberg and Kauders (Klin. Woch., June 14, 1924), the condition of the gastric secretion can be inferred from exact observation of the changes in the width of the pupils. Whereas in normal or hyperacid patients a narrowing of 0.75 to 1.5 mm. always occurs, in 10 anacid patients the pupils regularly remained unchanged. This phenomenon is ascribed to the fact that when no acid is secreted the customary rise of CO<sub>2</sub> tension in the blood and alveolar air fails to occur; such a rise, when present, contracts the pupils. The test is especially distinct in patients with unusually wide pupils.

Most patients with apparent achlorhydria, according to F. L. Apperly (Med. Jour. of Austral., Aug. 11, 1923), have a normal secretion of acid, but this is neutralized as rapidly as formed by marked regurgitation of duodenal alkali, probably due, in turn, to increased intestinal irritability. In the treatment, the loss of free gastric acidity should be made up with hydrochloric acid, and measures taken to allay the intestinal irritability and raise gastric tone.

To produce benefit in gastric atony, according to I. T. Bennett (Brit. Med. Jour., Mar. 3, 1923), only very small doses of strychnine should be used. Sodium bicarbonate is most useful in the rather rare cases in which there is an excess of mucous secretion with low or absent HCl. With precautions, pilocarpine will increase gastric secretion; after lavage with pilocarpine the stomach empties more rapidly. E. Schütz (Arch. f. Verd., Jan., 1923) finds that diarrhea in anacidity which is not improved by drugs or diet, particularly

abstinence from meat, is often relieved by energetic, continuous exhibition of hydrochloric acid.

D. Vanderhoof (Arch. of Int. Med., Dec., 1923) deems achlorhydria an essential predisposing cause of combined spinal sclerosis, which it precedes and accompanies. The prognosis is favorably influenced by hydrochloric acid in full doses together with removal of any foci of infection found. One teaspoonful of the official dilute acid, well diluted, should be taken with each meal, and in some cases a 2d teaspoonful 1/2 hour after the meal. It is best given in buttermilk, but may be taken in sweetened lemonade, orangeade or iced tea, to be sipped during the meal. No food except acid fruits or buttermilk, natural or soured with lactic acid bacilli, may be taken by the patient between meals.

NEUROSES.—A rapid form of suggestive treatment applicable in many cases of neurosis is described by J. Kläsi (Zeit. f. d. ges. Neur. u. Psych., Apr. 18, 1923). From the anorexic patient is ascertained the food which was badly borne at the beginning of his trouble, as well as the food which he does not tolerate at the time; often these are identical. He is then isolated in a room and given 3 times daily a cup of black tea and 1 piece of sugar, until there is complaint of hunger, i.e., in 5 or 6 days. The same régime is kept up for another day or 2, whereupon the patient is given the diet which had previously been least tolerated. As he realizes that he can stand this diet, and therefore any other food, the diet is then promptly discontinued. An excellent effect in 6 cases is reported.

H. Citron (Deut. med. Woch., Jan. 25, 1924) supplements psychotherapy with treatment of hypo- or hyperacidity and gastric lavage, followed by the introduction of nourishing food. For pain he recommends a 0.2 per cent. solution of silver nitrate, 1 tablespoonful 3 times daily in ½ wineglassful of distilled water.

M. Loeper and R. Turpin (Presse méd., Apr. 2, 1924), in nervous dyspepsia, simple gastritis, gastritis with ulcer and gastric epithelioma, have had success from daily ingestion of 2 to 3 Gm. (30 to 40 grains) of sodium borate or sodium tetraborate. These drugs are preferable to bromides for relieving painful spasmodic, secretory or vasomotor reactions, and are slightly alkaline and antiseptic. They call for intermissions at the end of 8 or 10 days, however, their effect generally not being maintained beyond this period.

PTOSIS.—In the diagnosis of gastroptosis T. Martini and J. Comas (Prensa med. Argent., Aug. 20, 1924) stress the value of fluoroscopy 1st with the stomach empty, then after 1 swallow of the opaque material, and again after the whole amount has been taken. To ascertain what may be expected from a supporting device they have the patient push up his stomach with both hands.

In severe cases with denutrition and nervous symptoms, P. Carnot (Paris méd., Apr. 5, 1924), keeps the patient in bed almost continually and feeds him up. Ordinary activities are resumed only in proportion as the body weight increases. Feeding the patients in a reclining position is important. In cases of moderate severity, the patients, while permitted to follow their usual activ-

ities, take 3 small meals during the day, the principal meal being eaten at night and the patient going to bed immediately thereafter (vesperal digestion in the reclining position). The small meals consist of small amounts of liquid or soft foods that pass rapidly through the pylorus and exert a pronounced stimulating action in comparison to their bulk, viz., raw meat, eggs, sugar, etc. The large evening meal, on the other hand, consists of bulky and nourishing but unstimulating foods.

P. Bastianelli (Arch. ital. di chir., Dec., 1923) favors surgical treatment as soon as medical measures such as diet, tonics, hydrotherapy, abdominal massage, supporting belts and elevation of the pelvis after meals have proven ineffectual. Fixation operations usually yield only temporary results. The operation of choice is posterior gastrojejunostomy, with an afferent loop 15 or 16 centimeters (6 or 6% inches) long, so that the posterior wall of the stomach shall not be fixed by the The omental attachments loop. should be left intact in order not to interfere with passive rotation of the stomach during digestion. The pylorus should be obliterated. With this technic no gastroplication is required. If, previous to the gastroenterostomy, it is found that restoring the liver to its proper place also replaces the duodenum and pylorus, hepatopexy is indicated.

**ULCER.** See Gastric Ulcer.

stomatitis with the Vincent type of infection, *i.e.*, with spindle-shaped bacilli and spirochetes, V. Jelinek (Wien, klin. Woch., May 31, 1923), in 82 cases,

witnessed prompt subsidence of the ulcerations under local treatment with ethyl chloride, whereas under all other measures the condition persisted for weeks. Mere applications of ethyl chloride gave no result, showing that the freezing was the active factor. Either 1 or 2 freezings on successive days sufficed. Relapses were limited to 6. He suggests this treatment be tried in other spirochete infections such as pyorrhea alveolaris, the gingivitis in scurvy, etc.

In a case of recurrent painful ulcerations in the mouth, J. Cervera (Sem. méd., Jan. 17, 1924) observed marked benefit under neoarsphenamin treatment, although the Wassermann reaction was negative. The condition returned when the treatment was discontinued.

In the stage of mercurial stomatitis in which there is complaint of tenderness of the palate behind the incisors, Foreman (Jour. Roy. Army Med. Corps, May, 1923) covers the point of a fine bristle with cotton, saturates it with pure chromic acid, and applies this carefully around the necks of the teeth. In the more advanced cases with marked ulceration and very acute pain, he directs that a syringe be used with hydrogen peroxide and warm water between the teeth to remove loose matter, then goes carefully around with cotton, using cotton pellets and tweezers, to remove as much as possible of the tartar, etc. After another wash with peroxide and water, the gum margins are swabbed with chromic acid on cotton and tweezers, followed at once with peroxide and water (equal parts), which prevents severe caustic effects. Considerable relief follows the 1st hour or 2 of discomfort. Used after every meal, the peroxide mouth

wash is very beneficial. At the 2d examination, 2 days later, the teeth can be scaled without unusual pain. Chromic acid is again applied. A milk diet greatly accelerates recovery. Extraction of teeth during the treatment should be avoided. Dentures, if worn, should be disinfected daily, and tooth brushes, at the time of each treatment.

STRABISMUS. -Landolt (Amer. Jour. of Ophth., Feb., 1923) emphatically disagrees with the view that amblyopia in the deviating eye is a result of the strabismus. The amblyopia exists prior to the strabismus, is 1 of its principal causes, and shows little gain in visual acuity upon correction of the strabismus. In the treatment of practically all forms requiring operation, he advocates muscle advancement, with resection when necessary. Simple tenotomies are condemned, both in vertical and paralytic strabismus and in the ordinary affections of the lateral muscles.

STRONTIUM.—A rapid analgesic effect on the part of strontium salts in various disorders was observed by W. Alwens (Deut. med. Woch., Apr. 25, 1924). Strontium chloride may be given intravenously, subcutaneously or intramuscularly, 10 c.c. (2½ drams) of a 10 or 20 per cent. solution being well borne intravenously and 5 c.c. (80 minims) of a 20 per cent. solution by the other 2 routes. Strontium bromide is the most strongly analgesic, and its use in chronic pain may avoid the need of morphine in habit-forming doses. It is serviceable in neuralgia, neuritis, the lightning pains and crises of tabes, the pain of cancerous bone metastases, that of chronic arthritis, and the spasms of multiple

SYPHILIS. — DIAGNOSIS. — Among the points emphasized by H.

H. Hazen (Amer. Jour. of Syph., July, 1923) in connection with the examination of a patient in view of a diagnosis of syphilis are the following: In a female the cervix should always be examined. A scar on the genitals is not certain evidence, as it may be due to chancroid, superficial diseases or trauma. faint roseola may be overlooked in a Annular syphilides, dark room. broken-down gummas and certain of the nodular eruptions are pathognomonic. Mucous patches can usu-Tender tibial ally be recognized. nodes suggest syphilis strongly. The frontal bones and sternoclavicular joints must also be examined. Search must be made for an enlarged liver and spleen.

The eyes should be examined for iritis, iridocyclitis and muscular paralyses. Cardiovascular examination is important, especially for a systolic murmur in the aortic area and myocardial weakness. In the neurologic examination: Size, inequality and reaction of the pupils; hearing tested; jaw, elbow, abdominal, cremasteric, patellar and Achilles reflexes; tremor; Romberg sign. A skilled ophthalmologist may be able to diagnose syphilis from the eye-grounds. Cystoscopy may reveal a trabeculated bladder, which is usually tabetic.

The Wassermann reaction is but 1 of the many signs of syphilis. The spinal fluid (Wassermann, cell count, globulin test and gold-solution reaction) often reveals an unsuspected neurosyphilis. Dark-field examination usually permits early diagnosis within a few minutes, and is much more satisfactory than stains. When the dark field is negative, gland puncture is indicated.

According to J. H. Stokes and H. A. DesBrisay (Can. Med. Assoc. Jour., Aug., 1924), who studied the records of 800 patients examined at the Mayo Clinic, obscure onsets, unrecognized primary and secondary lesions, and even absence of clinical primary and secondary lesions as such, must be reckoned with in as high as 25 per cent. of the average diagnosed syphilis in medical consultant practice. In women the proportion is much higher. margin of syphilis which, even though untreated, is Wassermannnegative in the blood by ordinary technic in a diagnostic practice is about 30 per cent. Neurosyphilis is the type which shows a distinct tendency to Wassermann-negativity in the blood, and hence calls for fuller testing by other means, especially the spinal fluid examination, to establish the diagnosis in the period of latency, when treatment may yet be of value.

The value of inequality of the pupils in early diagnosis and unrecognized cases is emphasized by C. Cantieri (Morgagni, July 13, 1924). While not every patient with anisocoria is a syphilitic, the symptom is sometimes the key to a diagnosis of syphilis. In a patient with intermittent high fever, previous to the discovery of bilaterally enlarged inguinal glands, anisocoria led to the suspicion of syphilis, which was confirmed by blood test. In a case in the primary stage, with many misleading symptoms, anisocoria led to the necessary examinations and the diagnosis.

O. S. Ormsby (Northw. Med., Feb., 1924) urges the need of early recognition of the primary lesion, since if it has existed 12 days or more, gen-

eral dissemination has probably oc-Any superficial ulceration or abrasion in the genital region should be subjected to dark-field examination. Of the cutaneous lesions, pustules are now less common than formerly and usually occur in cachectic subjects. The copaiba eruption is differentiated from the macular syphiloderm by its slightly papular character, brighter hue and itching. Pityriasis rosea is differentiated by the presence of scaling. The flat psoriasiform papule of syphilis is distinguished from psoriasis by its indurated character and the collaret of scales around its margin, whereas in psoriasis the scales cover the whole lesion and are imbricated. In the late lesions-nodules, gummas and ulcers-the chief diagnostic feature is their ability to disappear spontaneously and reappear in new situations.

That persistent fever may occur as the sole manifestation of syphilis, local evidences of the disease having been wholly absent, is pointed out by M. Bloch (Presse méd., May 17, 1924). In 3 cases he reports, the discovery of the positive Wassermann and institution of antisyphilitic treatment abruptly cured the prolonged illness. Such patients may remain in a relatively good general condition, though their life be rendered a burden by the protracted fever, which may exhibit the characters of malaria, typhoid or Malta fever. Each of his patients had a slightly enlarged liver, suggesting that syphilis of this organ may be the source of the fever.

The following forms of pulmonary syphilis are recognized by C. P. Howard (Amer. Jour. of Syph., Jan., 1924):

Gummas; chronic interstitial pneumonia; pulmonary sclerosis; syphilitic phthisis, and bronchopneumonia. He suggests, as important points in the diagnosis: (1) Absence of symptoms proportionate to the physical signs; (2) sputum constantly negative for tubercle bacilli; (3) other stigmata of syphilis; (4) a routine Wassermann in cases of unusual lung disease; (5) the therapeutic test; (6) a search of the sputum with dark field illumination. suspected lung syphilis, a thorough course of antisyphilitic treatment is justified. While little or nothing can be expected from it in the sclerotic forms, its success in the gummatous form is undeniable.

A. Oro (Rif. med., Sept. 22, 1924) reports cases showing that syphilis of the adrenal glands may lead either to Addison's disease or to incomplete forms of this syndrome. He advocates trial of antisyphilitic treatment in Addison's disease whenever one is not entirely certain of a tuberculous nature of the disease of the adrenals. In the secondary stage the adrenals are sometimes involved so rapidly that there is no time for the specific treatment to act; in many cases, however, such treatment is successful in checking the condi-In the later stages of syphilis, the adrenal involvement is less rapid and more amenable to treatment. One of the writer's cases had frank Addison's disease together with symptoms due to syphilis of the spinal cord. The treatment completely dispelled the Addison's disease.

Cases of pernicious anemia due to syphilis are reported by F. Hoff (Deut. Arch. f. klin. Med., June, 1924). As pernicious anemia of

"cryptogenetic" type causes death, antisyphilitic treatment is advisable in doubtful cases in which parasites or pregnancy can be excluded as causes.

In a case of trifacial neuralgia of 7 years' standing with negative Wassermann, M. Pinard (Bull. Soc. méd. des hôp. de Paris, Dec. 20, 1923) made a diagnosis of inherited syphilis on the basis of myopia and astigmatism, which had developed at 24; white spots on the median incisors, and vitiligo on the neck and chest. Three injections of 0.15 Gm. of neoarsphenamin cured the patient.

From a study of the influence of chancroid upon syphilis, H. Haxthausen (Ann. des mal. vén., Dec., 1923) concluded that sometimes chancroid seems definitely to attenuate the primary and secondary symptoms of syphilis, and likewise the blood Wassermann. The primary adenitis and induration of the chancre may be rendered less marked, and other symptoms may appear very late, sometimes being delayed several years. The cerebrospinal fluid seems to escape the attenuating influence; albumin and cells in it may be increased in the presence of a negative Wassermann. Therefore, lumbar puncture is indispensable when there is the least doubt of syphilis associated with a venereal ulcer.

CLINICAL EXAMINATIONS AND TESTS.—DEMONSTRATION OF SPIROCHETES.—In comparative tests of various staining methods, R. Gilbert and H. A. Bartels (Jour. of Lab. and Clin. Med., Jan., 1924) found the following percentages of positives after the respective procedures: Fontana's method, 80 per cent.; Becker's, 60 per cent.; Noguchi's, 44 per cent.

The following staining method is offered by R. Griesbach (Münch. med. Woch., Jan. 25, 1924): After brief fixation over the flame, the specimen is stained for 3 minutes with 5 per cent. *potassium permanganate* solution, then rinsed in water and stained for 2 minutes with 10 per cent. *carbol-fuchsin*. The spirochetes from the mouth take a deep brown stain and *S. pallida* a lighter tint.

Noguchi's method of staining smears proved very satisfactory in 25 cases in the hands of G. A. M. Hall and C. N. Frazier (China Med. Jour., July, 1924), who found it more expeditious than the dark-field procedure. H. Muhlpfordt (Derm. Woch., Aug. 9, 1924) recommends a 3 per cent. solution of *Victoria blue 4 R*, applied for 2 to 3 minutes, after which the specimen is washed and dried.

A simple method for the demonstration of the spirochete in tissue sections is described by W. Krantz (Münch. med. Woch., May 9, 1924): The frozen sections, fixed in formalin, are 1st rinsed in distilled water, next placed in 0.1 per cent. silver nitrate solution, and then for 4 to 24 hours in the paraffin bath. Finally they are washed with distilled water and placed in a solution consisting of pyrogallol, 0.2 Gm.; distilled water, 15 c.c., and acacia solution, 5 c.c. The reduction of the silver which thus occurs takes from 1/2 to 1 hour and is watched by occasional microscopic examination of a section. When it is complete, the sections are washed with tap water to remove the acacia, and passed through alcohol and xylol. The spirochetes are stained black on a yellowish brown background. For successful results, clean glassware free of salt and pure distilled water are necessary.

The diagnostic utility of dark field illumination in the tertiary stage is pointed out by Klugh (Jour. Med. Assoc. of Ga., Feb., 1924). The Wassermann is usually negative or only weakly positive, while the clinical signs and history may be inconclusive. Demonstrating the spirochete, therefore, is the only means of certain diagnosis. Its presence in all forms of tertiary lesions has been proven. It is found in the serosanguineous fluid from the margins of the ulcerated areas. The ulcer is 1st wiped clean of pus and necrotic tissue with dry sterile gauze, and its edges then traumatized until bloodtinged serum exudes. This may be transferred to the slide with a capillary pipet or, when feasible, by pressing the slide over the ulcer. A cover-slip is applied at once, to prevent drying, and the specimen examined promptly, while the spirochetes are still motile. This procedure revealed the organism in all of 3 cases of chronic osteomyelitis of the tibia.

SERUM REACTIONS. - Wassermann Reaction.—As emphasized by H. L. Keim (Ann. of Clin. Med., Oct., 1924), the serum reaction is but a single sign and should be accordingly so valued, and like all laboratory data, should be 2d in importance to careful clinical deductions. In secondary syphilis, a negative reaction is sometimes obtained in denutritive cases in which the body resistance is overwhelmed. In late cutaneous and mucous membrane involvement, the reaction is occasionally negative. Careful clinical examination will often help establish the correct diagnosis, and as a final word, recourse may be had to the microscopic examination. Once the diagnosis is made, the negative biologic tests should in no way alter the vigorous prosecution of specific treatment. Late bone syphilis, particularly in the small bones of the head, occasionally gives a negative test. The character of the bone changes, clinically and radiographically, will help solve the problem. Not infrequent negative tests occur in frank tabes and well-developed diffuse cerebrospinal syphilis. Clinical examination and deductions, with lumbar puncture, are of assistance. Vascular syphilis with cerebral signs as predominating feature also frequently gives a negative reaction. In late and latent syphilis, even in the absence of treatment, a positive test may disappear, and return a few months or years later.

The provocative complement fixation test has been reviewed by S. S. Greenbaum and C. S. Wright (Amer. Jour. of Syph., Oct., 1924) in the light of the now widely adopted Kolmer standardized technic for the Wassermann reaction. The method they employed was to draw blood for a preliminary control test, then inject intravenously 0.45 Gm. (0.15 to 0.03 in children) of neoarsphenamin. Blood was then taken for daily Kolmer tests for 3 days and again on the 7th day. The preliminary control blood was examined along with the blood drawn on the 2 following days. Among the 100 cases studied, the clinical types comprised patients with a history of infection; with suggestive clinical findings; with a history of conjugal syphilis; children with 1 or both parents syphilitic; cases presumably cured and free from clinical or serologic symptoms for many months, and patients with

active syphilis. The results showed reversal from negative to positive in 16.6 per cent. of cases. The Kolmer test does not increase the percentage of positive provocatives, the average with older tests having been 18.3 per cent., and it does not remove all risk of false positives. Most positives occurred in patients who might have been pronounced cured by reason of long serum negativity. Hence, the test's greatest value lies in indicating persistent disease. Most provocatives develop within 24 to 48 hours. Provocatives rarely aid in determining the presence or absence of syphilis on 1st examination in syphilitic parents' children. The test is valuable in some cases to support clinical diagnosis and, though it is of little help in diagnosing suspicious infection, the possible occasional aid renders its performance at times imperative. A negative provocatory test by no means excludes syphilis.

Syphilis

Kahn Precipitation Test.—This procedure has been improved by Kahn (Jour. Amer. Med. Assoc., July 14, 1923) so that incubation is eliminated and the final reading is obtained a few minutes after simply adding antigen to the inactivated serum. The results are recorded as in the Wassermann, a heavy precipitate being designed as a four plus reaction. Constancy of results among different workers has been secured by standardizing the various steps of the technic.

The diagnostic value of this test was studied by H. L. Keim and R. L. Kahn (Arch. of Derm. and Syph., Dec., 1924) in 2600 cases in comparison with 2 Wassermann tests-1 highly sensitive and the other more conservative. In primary syphilis it proved slightly more sensitive than either of the Wassermanns. In secondary syphilis the 3 methods agreed. In tertiary syphilis (excluding cerebrospinal) it proved slightly more sensitive than either of the Wassermanns, except that in visceral syphilis it compared with the more sensitive Wassermann. In cerebrospinal syphilis, the results fell about midway between the highly sensitive and conservative Wassermanns. In latent syphilis the results compared favorably with the highly sensitive Wassermann, and likewise in congenital syphilis. In non-syphilitic controls (1975 cases), the Kahn gave two 1+ and two

2+ reactions in apparently non-syphilitic skin conditions.

Herrold Ring Test .- This test, as will be recalled, represents an adaptation of the Kahn test to the familiar "ring" procedure in chemical tests. M. H. Ebert and J. H. Mitchell (Ibid., July, 1924) have made comparative tests of the Herrold and Wassermann in 1075 cases of syphilis. There was virtual agreement in 865 cases and approximate agreement in 946. When the 2 tests did not agree, the Wassermann was the more sensitive in the majority of instances. Among 885 non-syphilitic cases, agreement was virtual in 802 and approximate in 864. There was a false strong Herrold test in only 0.68 per cent. It agrees with the Wassermann in untreated secondary and congenital syphilis. It becomes positive later than the Wassermann in untreated primary syphilis. It is less sensitive than the Wassermann in treated cases and later in the disease. It is unsatisfactory in central nervous syphilis. It is positive in a small but definite number of cases of syphilis in which the Wassermann is negative. It is liable to errors of a different order than those of the Wassermann. It is a valuable control for routine use with the Wassermann. If skillfully employed, it is an admirable test for office use.

McGlumphy Flocculation Test.-In this test, advantage is taken of the fact that addition of glycerin to the mixture of alcoholic extract and serum increases the size of the floccules when the test is positive, thus facilitating the reading. C. B. McGlumphy (Jour. of Inf. Dis., Dec., 1924) advocates performance of this test along with the Wassermann; because of its simplicity, the additional time required is negligible. An alcoholic extract of heart muscle is diluted, and receives 0.05 to 0.1 c.c. of glycerin for each serum to be tested. These reagents having been thoroughly mixed, they are diluted with enough 3 per cent, sodium chloride solution to supply 0.6 to 0.65 c.c. for each sample of serum. Of this diluted extract, 0.8 c.c. is added to 0.2 or 0.3 c.c. of serum. The serum is then incubated, and readings are made in 12 to 18 hours and again in 36 to 48 hours. In a negative reaction the solution shows no appreciable changes, while when it is positive the suspended floccules are plainly

visible. There was 95 per cent. of agreement with the Wassermann. The latter proved the more sensitive, but gave a large number of false positives, while the floculation test did not.

PROPHYLAXIS.—H. J. Nichols and J. E. Walker (Jour. of Exp. Med., Apr., 1923), in tests on the scarified scrotum of rabbits, found that 30 per cent. calomel ointment proved efficacious in prophylaxis up to 8 hours after inoculation with syphilis. No marked difference could be seen between the action of calomel in a base of lanolin and 1 of benzoinated lard and wax. Death from mercurial poisoning resulted from a single application of a large amount of calomel ointment.

The prophylactic action of stovarsol taken by mouth is deemed of some interest by B. Bloch (Schweiz. med. Woch., Sept. 4, 1924). Two cases of massive inoculation with spirochetes are said to have been warded off by taking 2 Gm. (30 grains) of the drug 21/2 and 16 hours after inoculation in the 1st case, and in the 2d case by 1 dose taken after 5 hours. A considerable number of individuals exposed in sexual contact are stated to have been protected. The drug cannot be considered entirely harmless, however, and the writer does not regard the method available as yet for general application.

W. Kolle (Deut. med. Woch., Aug. 8, 1924) found in rabbits that a single depot of an insoluble bismuth salt left in the body could render the animal refractory to inoculation with syphilis for as long as 4 months.

TREATMENT.—It is generally believed that, as stated by L. Hauck (Münch. med. Woch., Aug. 8, 1924), arsphenamin has an effectual spirocheticidal property when given within 3 or 4 weeks after infection. After a sufficiently large dose, the spirochetes usually are no longer to be

found in the initial lesion after 24 hours. Bismuth will generally produce this effect after about 4 injections.

According to W. A. Pusey (Atlantic Med. Jour., Jan., 1925), however, arsphenamin, if used too early in the course of the disease, before it has had a chance to evolve itself completely and stimulate proper resistance, leads to a dangerous situation, in which the patient is not cured of his syphilis and has a focus of infection lest with no resistance developed to withstand it. This observer deems arsphenamin dangerous in the early stage of syphilis unless it can be used to the point of eradication; otherwise, it had better be omitted, at least for the 1st 3 months. Mercury seems to stimulate immunity, and should therefore be used in the early course of the disease.

In regard to the abortive treatment, R. Polland (Wien. klin. Woch., Feb. 14, 1924) recommends about 10 intravenous arsphenamin injections of 0.2 to 0.4 Gm. each in combination with a mercury preparation in the same syringe, and asserts that if the treatment is begun within 3 weeks after infection, cure may be expected in 90 per cent. of cases; if within 4 weeks, 75 to 80 per cent.; if within 5 weeks, 50 to 60 per cent., and if within 6 weeks, about 40 per cent. A positive Wassermann does not preclude success of the abortive treatment, and even a permanently positive Wassermann does not necessarily mean incurability, especially if no clinical symptoms have occurred; apparently antibody formation may continue beyond the duration of the disease and perhaps throughout life. Even an apparently successful abortive treatment should be followed by several after-treatments.

According to Goubeau (Ann. des mal. vén., Nov., 1923), antisyphilitic measures, to yield the best results, must approximate a certain standard treatment. Experience with single drugs and various combinations of drugs in 2000 cases leads him definitely to insist always on a triple mixed treatment comprising an arsphenamin compound, mercury and iodides. Increasing the dose of a single drug where there is resistance to it is not advantageous; when the body is saturated with arsenic, more of it does harm.

In the mixed treatment the 3 drugs should form an unbroken series, with adequate dosage in each case. He reckons the dose of arsphenamin as 0.01 Gm. per kilo.  $(2\frac{1}{5} \text{ lbs.})$  of body weight, and of neoarsphenamin, as Allowances should be 0.0133 Gm. made, however, for adiposis or athletic musculature. To avoid severe reactions, the initial (entire) dose of neoarsphenamin may be 0.1 Gm. Eight or 9 injections are usually enough in the 1st series; in later courses, 8, 6, 5 or 4 injections may be given. The dosage should be increased gradually, and febrile reactions or temporary reactivations should not cause interruption of treatment.

Mercury is best given intramuscularly as the benzoate or biniodide, each injection consisting of 0.03 or 0.04 Gm. (½ or ¾ grain). Fifteen to 18 injections may be given on alternate days or 3 times weekly. If the frequent visits are not feasible, 6 to 8 injections of calomel (0.06 to 0.1 or 0.14 Gm. (1 to 2½ grains)) or gray oil may be substituted. Potassium iodide is begun at once after the last injection of a soluble mercurial or 1 week after an insoluble mercurial. From 3 to 4 Gm. (45 to 60 grains), or occasionally 6 Gm. (90 grains), are given daily after an initial dose of 1 Gm. (15 grains), increased to the larger amounts in the course of the 1st week. If signs of iodism appear, a peptonated preparation of iodine should be substituted.

In the general plan, 7 or 8 weeks are thus allowed for arsenicals, 5 or 6 for mercury, and 4 for the iodide. A month should elapse between this 1st course and the 2d, and  $2\frac{1}{2}$  months between the 2d and 3d. The treatment must be continued for 3 years, comprising 6 courses.

The unfavorable effect of alcohol and nicotine on the activity of arsphenamin is pointed out by A. Huebner (Urol. and Cut. Rev., Feb., 1925). In groups of prisoners and hospital patients receiving arsphenamin in Germany, the prisoners, deprived of these habit-forming agents, showed 91 per cent. of negative Wassermanns after treatment as against 45 to 62 per cent. in the hospital group.

Bismuth therapy is highly regarded by E. Hoffmann (Ibid., Jan., 1925), who refers to its being active in all stages of syphilis and causing only slight complications when the patient is carefully watched and the dosage regulated. The absence of pain after administration renders its use easy for the practitioner and patient. For the quickest cure and prophylactic action, arsphenamin should always be used with bismuth in primary and secondary syphilis. The writer gives at least 1 course in recent seronegative lues; in primary cases with only transiently positive Wassermann, at least 2 courses at an interval of 5 to 6 weeks; in early secondary lues, 3 courses. Cases of longer standing, especially tertiary, do not require such intensive treatment. The writer gives 10 to 12 intragluteal injections of 1 c.c., or rarely 1.2 or 1.5 c.c., of the bismuth preparations, milanol, bismogenol or mesurol, twice weekly. Bismuth has often given good results in visceral syphilis, with or without iodine. The results obtained in syphilitic aortitis are of special importance.

G. W. Raiziss (Amer. Jour. of Clin. Med., Dec., 1924) refers to the recent view that joint use of the arsphenamins and bismuth will result in fewer cases of arsphenamin-resistance, and that such patients will, as a rule, do much better on bismuth. Excellent results have been obtained with it where the arsphenamins have failed, particularly in the tertiary stage.

[See also BISMUTH.]

Satisfactory results from a calomel suspension taken by mouth are reported by P. Saxl (Wien, klin, Woch., Feb. 7, 1924) with reference to 41 cases of syphilitic mesaortitis, 2 of hepatitis, 2 of gumma of the liver, 6 of endarteritis, 2 of tabes dorsalis, and some cases of secondary skin and mucosal manifestations. Salvarsan was also used in 25 of the 41 cases of mesaortitis. A milky, stable 1 per cent. suspension of finely divided calomel was given in doses of 20 drops (containing 0.01 Gm. calomel) 3 times a day before meals, rapidly increased to 40 drops. The preparation was well absorbed and caused few by-effects; frequently a diuretic action was noticed.

S. S. Greenbaum and C. S. Wright (Arch. of Derm. and Syph., Nov., 1924) find non-specific protein therapy a beneficial adjunct measure in some cases. Of 35 cases treated, 29 had latent syphilis with a persistently positive Wassermann. In 3 cases there was a reversal of the reaction to negative. In acute secondary cases certain varieties of skin lesions involuted rapidly following the protein injections, whereas in other types the eruption became extremely profuse after the stimulation. Tertiary gummatous and ulcerative lesions were rapidly checked and healed. The procedure consisted in giving 6 preliminary intragluteal injections of a 4 per cent. sterile suspension of milk protein, at 2 or 3 day intervals. This was followed by a series of weekly neoarsphenamin injections.

Jaureguy and Lancelotti (Bull. de l'Acad. de méd., Dec. 2, 1924) describe 12 years of study of the syphilis of the South American llama, which is etiologically identical to that of man. An immune llama serum has been prepared and found curative in the primary stage in llamas as well as in 6 cases in man, the latter still having negative reactions after prolonged observation. One hundred human cases, including paretics, have been treated with favorable results.

Good results have been reported by H. Krösl (Arch. f. Derm. u. Syph., Mar., 1924) from a preparation of sodium orthovanadinate, a vanadium salt, injected intravenously in doses of 0.03 to 0.1 Gm. In most instances 0.05 Gm. in 3 c.c. of distilled water was injected on alternate days. The drug proved effective in all stages of the disease, both clinically and as regards the Wassermann. The rapid disappearance of mucous membrane lesions was comparable only to that produced by salvarsan, mucous patches

in 89 secondary cases clearing up after 2 or 3 injections at most. Eight tertiary cases were similarly cleared up. The drug seems to be free of all risk on intravenous injection.

#### CEREBROSPINAL SYPHILIS.

—Of 45 cases followed by G. Draper (Amer. Jour. Med. Sci., Jan., 1925) to ascertain the late results of intravenous and intraspinal treatment, 25 dated back 10 years. The Swift-Ellis method is undoubtedly effective in a certain type of case representing about 36 per cent. of all cases of central nervous syphilis. does not depend alone on the spirocheticidal effect of arsphenamin and mercury. There is undoubtedly some other factor developed in the course of the treatment that successfully raises the resistance; when this factor fails to develop, no amount or intensity of drug and serum treatment can check the disease. All apparently cured patients should report for examination and spinal fluid test every 2 years or oftener.

INFANTILE SYPHILIS.—J. A. Kolmer (Atlantic Med. Jour., Aug., 1924) deems it highly probable that with few exceptions the fetus is infected by spirochetes from the mother. Just how the woman becomes infected when the man presents no open lesions but has a history of infection several years previously is not clearly understood. Infection through the semen seems to be the logical conclusion. seminal infections the virulence of the spirochetes seems to be greatly reduced and the resulting infection relatively mild. On the other hand, women infected by open lesions exhibit the usual clinical course of syphilis, although subsequent pregnancies tend to retard the progress of the disease, especially against infections of the central nervous system.

From X-ray study of the aorta in 462 children with congenital syphilis, J. J. and E. A. Beretervide (Rev. Asoc. méd. Argent., Aug., 1924) conclude that the aorta appears wider and darker in such children than in normal children. The normal maximal diameter of the aorta is 1 cm. up to the age of 8 and 1.3 cm. from 8 to 14. An aorta wider than this, or abnormally opaque, always means syphilis and calls for antisyphilitic treatment, to prevent aortitis later in life. An exaggerated 2d sound in the 2d or 3d interspace at the left sternal border usually accompanies this aorta sign.

TREATMENT.—Sulpharsphenamin, given intramuscularly, is being recommended in place of neoarsphenamin in infants. F. H. Boone and A. A. Weech (Amer. Jour. Dis. of Childr., Jan., 1924) report 21 cases treated with it, all below 1 year of age. Six weekly injections were given as a course, followed by mercury inunctions for 2 months, and then a 2d course. The maximum dose advised is 20 mgm. of the drug per kilo. of body weight. In view of the simplicity of the injections and

the almost uniform absence of local or general reactions, the method is recommended to the general practitioner. The drug was clinically effective and in 55 per cent. of cases the Wassermann became negative after 1 course of 6 injections.

In Wassermann-fast and neurosyphilitic children, H. Schussler, Jr. (Cal. and West. Med., Apr., 1925) gives every Tuesday for 8 weeks an intravenous injection of sulpharsphenamin, 0.4 to 0.8 Gm., and an intramuscular injection of bichloridol, 0.06 Gm. Every Saturday an intravenous injection of silver arsphenamin, 0.1 to 0.3 Gm., is given, together with an intramuscular injection of bismudol, 0.2 Gm. The intramuscular injections are well borne, and are made into the gluteus medius about 1 inch above the tip of the trochanter. Potassium iodide in full doses is given throughout. each course 1 month's rest is given, and the treatment is continued until 2 successive rest periods have been followed by completely negative (very sensitive) Wassermanns. Active treatment is then stopped if the clinical signs have also cleared up, but mercury protiodide is given by mouth for 2 months more to older children. A Wassermann is then taken every 6 months for 3 years.

## T

TABES DORSALIS.—In several cases of ptosis and external strabismus in tabetics, Paulian (Encéphale, Oct., 1924) found that these defects temporarily disappeared upon closure of the other eye. This peculiar automatic pseudocorrection being wanting in men-

ingeal lesions, tumors and osteoperiostitis of the base, it may be regarded as a differential eye symptom in tabes.

In regard to the *lancinating pains* of tabes, Wagner-Jauregg (Wien. klin. Woch., Oct. 2, 1924) points out that

they do not directly signify progression of the disease process, as they may be slight or decreasing when the disease is making rapid progress. They are induced by the action of irritation of meteorologic, alimentary or infectious origin on the altered nerve tissue. Overfeeding, in particular with sugar, renders the pains worse. Treatment has some effect on the tabetic process as well as on the pains, even if limited to mercury, with or without iodine; a better effect results from neoarsphenamin, with or without mercury, and a still better effect if with these are combined tuberculin or vaccine treatment, sodium nucleinate, etc. treatment as a whole, acting both on the tabetic process and the body at large, causes the latter to become less sensitive to the irritating factors that bring on the pains. Warm clothing is advantageous, but the writer disapproves of morphine, having seen persisting pain (tabes dolorosa) only in patients who had received it.

Non-specific stimulation therapy in tabes is advocated by E. H. Ahlswede (Arch. of Neurol. and Psych., July, 1924) as a preliminary to all specific measures. At 1st, a small stimulating injection, such as 2 c.c. of albumin milk solution, is injected into the buttock, and further injections are given every 3 or 4 days if the initial reaction has not been too strong. If the initial result is insufficient or nil, the 2d dose is slightly increased. The criterion of the stimulating effect is the local reaction rather than the temperature, and the blood picture and plasma reaction are followed throughout. About 5 injections generally yield a maximal stimulation, and the specific treatment is begun during the last 2 injections. Similar courses are repeated at intervals of at least 6 or 8 weeks.

As noted by Grinker (Amer. Jour. of Syph., Oct., 1923), the autoserosalvarsan method of Swift and Ellis is highly satisfactory in the parenchymatous type of neurosyphilis, which includes tabes and paresis. According to L. J. Foster and W. A. Smith (Jour. of Nerv. and Ment. Dis., Nov., 1924), bismuth yields as good results in tabes as any other treatment. Among 23 cases, the treatment was especially effective for pain, numbness, urinary disturbances and ataxia. Some patients recovered ability to walk and incontinence and retention of urine were usually relieved or improved. In 1 case sight was definitely improved. were no marked changes in the neurologic findings or serum tests.

X-ray irradiations were employed with good results by Simeone (Actinoter., Dec. 20, 1923) in ataxic tabetics after other measures had failed. Fifteen cases were treated over the occiput and spine, 1 of 4 zones being irradiated every 2 days. The current was 2 ma., gap 25 to 30 cm., distance 40 cm., filter 3 mm. of aluminum, time 10 to 15 minutes. The cycle of exposures was repeated 3 or 4 times. After an initial exacerbation, the patients showed disappearance and marked reduction of ataxia pains. In long-standing cases the effects, though good, were not as pronounced.

Intraspinal injections of sodium bromide solution proved very effectual in 3 out of 5 cases for the relief of *lancinating pains*, according to H. Lippmann (Deut. med. Woch., Feb. 23, 1923). In 1 case, as much as 20

c.c. (5 drams) of a 5 per cent. solution was borne without reaction. In 1 case of refractory daily pains of 8 years' standing, the pains did not return after 3 injections of a 1 per cent. solution, given at intervals of 2 and 3 weeks.

In a case of gastric crises characterized by attacks of violent vomiting, treated by E. Thomsen (Acta med. scand., Jan. 24, 1924), ophthalmoplegia was also present. Vigorous specific treatment was without effect. Test meals and the X-ray were negative. As atropine gave some relief, vagotomy was decided on, and the left vagus resected below the diaphragm. Complete relief promptly followed, and was maintained 1 year later, without noticeable disturbance of the functions of the other abdominal organs.

TACHYCARDIA, PAROXYS-MAL.—PROGNOSIS.—Discussing this subject on the basis of a series of cases observed at the Mayo Clinic, F. S. Willius and A. R. Barnes (Boston Med. and Surg. Jour., Oct. 9, 1924) divide the cases into 36 of nodal tachycardia, 7 of auricular tachycardia, and 6 of ventricular tachycardia. There was also 53 cases of auricular flutter. The occurrence of vertigo as a symptom seemed determined largely by the coexistence of arteriosclerotic processes reducing the blood-supply to the brain. Vertigo, syncope, and "spells of unconsciousness" always call for exclusion of paroxysmal tachycardia as a cause. The longest duration of attacks occurred in the cases of auricular flutter. Of the 84 patients subsequently traced, 25 had died, but only 20 of these deaths could be attributed to cardiac disease, giving a total death-rate of 24 per cent. Fifteen of the deaths were in patients

who had yielded definite findings of cardiac disease. The death-rates were high in cases of paroxysmal tachycardia with aortic and coronary disease (57 per cent.) and with endocarditis (46 per cent.).

TREATMENT.-Most of the recent therapeutic reports have dealt with quinidine. J. H. Musser, Jr. (Ann. of Clin. Med., Jan., 1924) saw 2 cases of paroxysmal auricular tachycardia, both materially helped by this drug. In 1 case there were also at times impure runs of auricular flutter. Under 0.065 Gm. (1 grain) of quinidine 4 times a day the patient had controlled her paroxysms very well for 2 years and resumed her F. W. Price regular occupation. (Brit. Med. Jour., Oct. 18, 1924) has used 5 grains (0.3 Gm.) of quinidine —after a preliminary test dose of 3 grains (0.2 Gm.)—once daily in several cases in the intervals between the attacks, to prevent their recurrence, with success in each instance. C. Lian (Presse méd., Apr. 5, 1924), in "extrasystolic" paroxysmal tachycardia, if ordinary measures fail to relieve the attack in a few hours, gives 2 to 4 doses of 0.2 Gm. (3 grains) of quinidine daily-to be stopped, however, if evidences of cardiac insufficiency develop. In the intervals he advises giving 2 to 3 doses a day on the 1st 10 days in every fortnight, this to be continued for several months.

In a case of syphilitic aortic insufficiency with severe decompensation and attacks of paroxysmal tachycardia associated with ventricular extrasystoles and alternating pulse, B. Samet and A. Schott (Wien. Arch. f. inn. Med., July 10, 1924) witnessed abrupt arrest of 1 attack upon intravenous injection of 0.25 Gm. (4 grains) of

quinine dihydrochloride, and in a later attack, by 0.4 Gm. (6 grains), injected a few hours after a 1st dose of 0.25 Gm. had failed. An instance of prolonged auricular tachycardia was relieved by H. Lenhartz and B. Samet (*Ibid.*, Oct. 15, 1924) by physostigmine, 0.0005 to 0.00075 Gm. (1/130 to 1/87 grain) daily, subcutaneously or by mouth, in conjunction with digitalis.

A. Clerc, P. Noël-Deschamps and J. Surmont (Bull. de l'Acad. de méd., Mar. 11, 1924) report a case of paroxysmal tachycardia of 10 years' standing and increasing severity in which an attack was checked by compression of the eyeballs. In this maneuver the patient's head should be low and enough pressure exerted on both eyes from the start to avoid an initial accelerating effect. Several compressions of 1/2 minute each may be made, the duration and intensity of stimulation being increased when required. In some cases pressure on the vagus in the neck will arrest attacks abruptly.

T. Wardrop Griffith (Brit. Med. Jour., Oct. 18, 1924) states that he has several times given morphine hypodermically during the height of an attack, with the happiest results.

TALIPES. —A device useful in the correction of club-foot, as well as flat-foot and fractures or luxations causing foot deformity, is described by O. Roith (Deut. Zeit. f. Chir., May, 1924). It is especially useful where no trained assistants are available. Plaster is 1st applied from the ankles to the knees; then, with the legs slightly apart, the 2 plaster dressings are bound in front to a crossbar by a figure-of-8 bandage reaching above the ankle. The bar projects several centimeters on both sides. The plaster dressings having hardened, the feet are straightened, padded as required, and plaster bandages then carried to them from the leg over the crossbar. Any needed

position of abduction, adduction, pronation, supination or dorsiflexion of the feet is thus obtainable. The dressing is easily maintained, and the feet are not entirely covered, thus more easily avoiding sores and facilitating inspection. Elastic bandages, to be renewed frequently, may be substituted for the plaster dressings when desired.

**TAPEWORM.**—According to H. Jacobaeus (Ugeskr. f. Laeg., Sept. 11, 1924), barbital, 0.4 Gm. (6 grains), given for 3 nights in succession before the vermifuge is taken, is valuable to prevent the vomiting which is a common cause of failure of treatment. By this means, in his experience, the percentage of cases in which the head of the parasite was found was increased from 66 to 82. Acetphenetidin, 0.4 Gm., may well be combined with the barbital, but neither may be used if no vomiting is expected. The dose of extract of male fern he gives to an adult is 10 Gm.  $(2\frac{1}{2} \text{ drams})$ , early in the morning, followed in 11/2 hours by a powder containing 0.5 Gm. (71/2 grains) of calomel and 2 Gm. (30 grains) of jalap. After another 11/2 hours, a strong senna infusion is given, and this is repeated 1 hour later, if required.

The duodenal tube is recommended by H. Schneider (Wien. klin. Woch., Apr. 3, 1924) for the introduction of the vermifuge, as it removes all risk of intoxication by permitting smaller dosage and also avoids vomiting. A purgative having been given the evening before, the tube is introduced next morning, ½ of an infusion of senna—5 Gm. (75 grains) in 50 c.c. (1% ounces) of water—injected, and

1/4 hour later, the rest of the infusion along with extract of male fern, 2 Gm. (30 grains), and extract of pomegranate bark, 4 Gm. (1 dram), introduced and the duodenal tube removed. The tapeworm is expelled entire in 1/2 to 2 hours. The same principle was advantageously applied in a case of duodenal catarrh due to Lamblia, in which, after other methods had failed, complete relief followed introduction of quinine in small doses through the duodenal tube.

TESTICLE, - According to H. Stiere (Arch. f. d. ges. Physiol., cc, 443, 1923), the interstitial cells of the testicle do not possess the function of a "puberty gland," as is widely believed, and serve merely as a trophic structure, storing up nutritive material for the growing seminal cells. Endocrin activity of the testicle does not parallel, according to this author, the condition of the interstitial tissue, but parallels seminiferous activity. M. Thorek (Endocrinol., Jan., 1924), from experiments with transplants and a review of the literature, maintains that the interstitial cells of Leydig are alone responsible for the internal secretion that gives rise to the secondary sex characters, sexual potency and cerebral eroticizing products. The Sertoli cells seem to carry nutrition in the form of fat to supply the spermatogenic function of the tubules. The Leydig cells are the most resistant of the testicular elements, and are the last to disappear in transplants.

**TRANSPLANTATION.**—A number of further reports on this procedure have been published. Thorek (Paris chir., Oct.-Nov., 1923) records 36 homotransplantations and

61 heterotransplantations in 69 cases of senile atrophy, 11 of destructive conditions of the testicles (injuries, tuberculosis, sarcoma, suppuration), 8 of neurasthenia and impotence, 5 of psychosis, and 4 of Fröhlich's disease, eunuchoidism and diminished genital activity. Complete symptomatic restoration was obtained in 45 per cent. of the 1st group, and varying improvement in all groups. Complete failure occurred in 18.8, 27.3, 37.5, 40 and 25 per cent., respectively, of the several groups above mentioned. He regards testicular transplantation as clearly indicated in the above conditions and in premature senility, symptoms accompanying the male climacteric, dementia precox with grave dysfunction and changes in the cells of Leydig, the psychoses of puberty of endocrin origin, impotence not due to gout, diabetes or organic nervous diseases, eunuchoidism, infantilism, homosexuality and hermaphrodism (if not too firmly established), incomplete genital development, some forms of sterility, chronic metabolic disorders of endocrin origin, sexual weakness from excesses, and certain cases of cryptorchidism.

As described by the same observer (Urol. and Cut. Rev., Nov., 1923), sons and near relatives are ideal donors for transplantation. Transplants may also be taken from sexually mature higher anthropoid apes, in which case the entire testis is used. With a human donor, 1/2 of the testis is excised, reconstructed and implanted, and the remaining 1/2 in the donor is reconstructed. The testis is stripped from the tunica vaginalis and small pieces of the tunica albuginea snipped out with scissors (lanternization), causing protrusion of testicular substance. A later procedure is to expose the tunica vasculosa and promote vascularization with the contiguous membranes by careful use of the thermocautery. The implant is then imbedded. Either the subperitoneal space, or better, the retrorenal space is used as the site of implantation.

H. L. Hunt (N. Y. State Jour. of Med., Dec., 1923) reports 84 ovarian or testicular implantations, of which only 8, he asserts, failed to show markedly successful results, 6 transplants not taking and 2 cases having an anaphylactic reaction. Sheep's ovaries and ram's testicles were found superior to cow's ovaries and bull's testicles. Among

the indications he recognizes are nervous or muscular debility, perversion, infantile generative organs in women, ovarian dysmenorrhea, high blood-pressure, functional impotence in the male, and frigidity and certain varieties of sterility in the female. In the 1st patient operated, 3 years before, the good effects are stated to be still continuing.

Reporting 10 cases of testicular graft, K. M. Walker (Lancet, Feb. 16, 1924) states that the use of grafts from cases of ectopia testis is the most practical method of obtaining suitable material. He usually places the grafts in the tunica vaginalis. While the results, in general, were distinctly promising, there were 3 cases in which the pituitary was probably mainly at fault, and the results from the transplants were limited. In 4 cases there was a definite effect on carbohydrate metabolism, and in 2, an increase in the respiratory exchange. In cases of pure testicular deficiency, grafts may so stimulate testicular and other endocrin tissue that development takes place which outlasts the life of the graft.

According to experiments by C. R. Moore (Endocrinol., July, 1924), the embedding of transplants in the vicinity of the peritoneal cavity hastens degeneration of the transplant through excess of heat. The temperature in the scrotum is 8° lower than in the peritoneal cavity. Raising the temperature of the scrotum artificially to this extent causes degeneration of the testes. He regards the scrotum as an essential thermoregulator for the testes.

TETANUS.—Recovery in 8 cases is reported by C. Smith and W. E. Leighton (Amer. Jour. Med. Sci., Dec., 1924). Subcutaneous injection of antitetanic serum should be tried first; if results are not prompt, the intraspinal route should be resorted to. This procedure had to be followed in 2 cases, and afforded prompt relief. Spasms should be controlled by subcutaneous injection of magnesium sulphate; this may be given intraspinally or even intravenously

when the condition is urgent. Careful personal observation is necessary to judge of the dosage and method of giving magnesium sulphate. Pushing magnesium to the danger point for complete relaxation is not required; when the spasms are enough alleviated to prevent exhaustion, morphine in average doses will complete the relief and permit restful sleep. In these cases the dose of magnesium sulphate was usually 16 to 20 c.c. of a 25 per cent. solution. The wound of infection should be opened, cleaned and exposed to the air, and tincture of iodine employed; serum should also be injected locally to block the progress of the toxin. An intramuscular or subcutaneous injection of serum should be given on the 8th or 9th day from the start of treatment, to keep up the prophylaxis. Fluids and nourishment should be supplied, with careful nursing.

From animal experiments Jagnov (Paris méd., Nov. 8, 1924) concluded that the quantity of serum given rather than the mode of administration is important. Four severe cases treated late all recovered under massive amounts on successive days, 1 case receiving 2700 c.c. in the course of 10 days.

In tetanus neonatorum, A. Bratusch-Marrain (Arch. f. Kind., Mar., 1924) recommends antitetanic serum subcutaneously and intraspinally; subcutaneous injections of 5 c.c. (80 minims) of 4 per cent. magnesium sulphate solution, at 1st twice daily, then gradually reduced to once on alternate days as the patient improves, and also chloral hydrate, to enhance the action of the magnesium.

TETANY.—According to the researches of G. H. Anderson and S.

Graham (Quart. Jour. of Med., Oct., 1924), active tetany is accompanied by a diminished calcium content of the serum. The severity of the tetany, however, bears no relation to the calcium diminution. In latent tetany there may or may not be a low calcium content. Production of acidosis invariably leads to disappearance of the signs of tetany, irrespective of a rise in the calcium content.

P. György (Jahrb. f. Kind., June, 1923) reports investigations showing that whereas, in rickets, the tendency is to acidosis, in tetany there is a tendency to alkalosis. The phosphates in the blood are scanty in rickets, while they abound in tetany. The blood potassium is normal in rickets, but reaches a high figure in tetany. The blood sugar is raised by injection of adrenalin in rickets, but in tetany becomes subnormal. Yet the 2 disorders are not antagonistic, since they may coexist, and in this event the tetany cannot be cured without curing the rickets first. The unknown primary cause, probably endocrin, apparently leads to a reaction swinging between acidosis and alkalosis.

TREATMENT.—The reported tendency to alkalosis in tetany is in harmony with the observation of G. Lindberg (Hygiea, Apr. 30, 1924) that inhalation of carbon dioxide acts favorably on the manifestations of spasmophilia. In tetany in children he recommends combined use of ammonium chloride and calcium chloride or bromide. The ammonium salt was used in doses up to 0.5 or 0.6 Gm. (7½ to 9 grains) per kilo. of body weight daily. C. Thompson (Jour. Med. Assoc. of Ga., Aug., 1924) favors large doses of either calcium chloride or calcium lactate. During an attack, 2 c.c. (32 minims) of 25 per cent, magnesium sulphate solution given intramuscularly every 3 or 4 hours will relieve the spasm until the calcium can be exhibited. Tetany due to alkalosis is best treated by large doses of decinormal hydrochloric acid or by the administration of ammonium chloride.

S. Graham (Glasgow Med. Jour., Mar., 1925) states that calcium chloride is much more efficacious than calcium lactate, and gives evidence to prove that this is because the favorable effect is not due to the calcium itself, but to the fact that the chloride tends to produce acidosis, as shown by Haldane in 1921. G. H. Anderson (Ibid.) states that calcium chloride proved equally efficacious in those cases of tetany which had no reduction of blood calcium. It is invariably safe to use and always successful. When a child is having, or has recently had, convulsions, laryngismus or carpopedal spasm, calcium chloride is best given in 30-grain (2 Gm.) doses every 4 hours till all symptoms are gone. Upon interruption on the 3d day, the symptoms nearly always return, but this is prevented by giving codliver oil at the same time and continuing it after cessation of the calcium salt. Favorable reports on ultra-violet ray treatment have also appeared.

PARATHYROID TETANY.—L. R. Dragstedt (Endocrinol., Sept., 1924) states that completely parathyroidectomized dogs were kept alive for long periods by preventing bacterial proteolysis in the intestine with a special diet, 75 Gm. of lactose and 500 c.c. of milk being given daily, with white bread ad lib. Parathyroid tetany is also prevented by intravenous injection of large amounts

of Ringer's solution or by large doses of calcium lactate by mouth.

In 2 middle-aged women with parathyroprival tetany seen by S. Hirsch (Klin. Woch., Dec. 9, 1924), the attacks were stopped by giving strontium bromide in doses of 3 Gm. (45 grains) daily.

A. Krecke (Zent. f. Chir., Jan. 12, 1924), in 5 cases of postoperative tetany, performed implantation of parathyroid glands from the horse, with eminently good results in 3 cases, slight improvement in 1, and no effect in 1, which was of 6 years' standing.

THROMBO-ANGLITIS OBLITERANS. See BUERGER'S DISEASE.

THYMUS GLAND.—STATUS THYMOLYMPHATICUS.—In the preceding Supplement reference was made (p. 757) to the fact that Ryser in 1921 had recalled the invariable presence, in this disorder, of hypoplasia of the medullary or chromaffin portion of the adrenals, as first shown by Wiesel in 1905. This suggests that the thymic enlargement in this disease may be due to insufficiency of the adrenal medulla. The possibility that such may be the case is sustained by the experimental observation of H. L. Jaffe (Jour. of Exp. Med., Nov., 1924) that removal of both adrenals in rats causes enlargement of the thymus, the process beginning 24 hours after the operation. While suggesting that the "regeneration" of the thymus might be due to a specific reaction of the latter, he states that the mechanism of the process is obscure.

The manner in which the thymus is caused to enlarge by removal of the adrenals, or through insufficiency of

the organs through local disease, was explained by C. E. de M. Sajous (Trans. Amer. Therap. Soc., May 21, 1925). He recalled that the copious vascular supply of the thymic cortex was dependent upon the adrenal secretion, precisely as were all the arteries of the body, owing to the presence in their terminal arterioles of unstriped muscle fibers. Removal of the adrenals, therefore, gives rise to dilation of these terminal vessels and to passive engorgement of the thymus with blood. Another factor which, according to Sajous, contributes to the thymic enlargement is the presence in the lymphatic tissues of the thymus of similar unstriped muscle fibers which have for their purpose to enable the gland to expel its lymphocytes or thymocytes as do the lymphatic nodes by means of the same kind of muscle fibers. contractile power is exemplified in the lymph hearts of many animals, which serve to sustain the circulation of their lymph. According to Sajous, what occurs in the thymus under these conditions is not a regeneration of the involuted thymus, as believed by Jaffe, but an abnormal deposition of fat in addition to the local hyperemia or congestion.

DIAGNOSIS.—As noted by Pfahler (Arch. of Ped., Jan., 1924), the X-ray therapeutic test is even more reliable than the immediate X-ray diagnosis of enlarged thymus. Thymic symptoms may occur even even when no enlargement is shown by the X-ray. Heavy breathing, wheezing or crowing respirations, cyanosis or an abnormal cry should direct attention to the thymus. Lymphadenitis of the upper mediastinum sometimes resembles enlarged

thymus very closely, but as both conditions yield to X-ray treatment, this is of little practical significance. The child is best examined while crying.

According to E. T. Evans (Surg., Gyn. and Obst., Oct., 1924), in newborn infants who develop cyanosis, constant or paroxysmal, in the absence of other definite cause, large thymus should always be suspected, and the infants given the benefit of radiation therapy. Plates should be taken before and after treatment. Negative plates, however, do not necessarily mean "no thymus pressure."

De Buys and E. C. Samuels (South. Med. Jour., Apr., 1924) have shown that the thymus shadow in the newborn infant varies in its size and position independently of the heart shadow. The shadow does not gradually increase or decrease uniformly in the healthy infant during the 1st year, but may vary in size, and these variations may exist without clinical evidence of disease.

TREATMENT.—In spite of the remarkable improvement afforded by X-ray treatment, G. W. Grier (Amer. Jour. of Roentgenol., Feb., 1924) has abandoned it in favor of radium, because of quicker response and greater ease and safety of application. He places four 25 mgm. tubes of radium in a wooden block with holes 1 inch apart. With 1 mm. brass filtration and the block kept exactly 3/4 inch from the skin, the treatment is continued for 10 hours. It may be repeated or extended to 12 or 14 hours if required.

THYROID GLAND.—THERA-PEUTICS.—Reid Hunt (Jour. Amer. Med. Assoc., Oct. 18, 1924) states that the action of thyroid is not known to be modified by the simultaneous administration of other

endocrin glands or of other drugs. According to Sturgis, the average amount of U.S. P. thyroid required to keep metabolism at a normal level in a patient with complete myxedema is 0.13 Gm. (2 grains) twice a day. H. S. Plummer and W. M. Boothby (Ibid., Oct. 25, 1924) deem it advisable, whenever possible, to determine the basal metabolism before thyroid treatment and regulate the treatment by repeated determinations. If this is not feasible, the metabolism should be estimated clinically by consideration of the pulse rate, pulse pressure, food intake in relation to amount of work done and to gain or loss of weight, feeling of warmth, evidence of perspiration, behavior of myxedematous edema, and slowness or rapidity of movements, expression and thought. Among the conditions other than myxedema and cretinism in which it may be desirable to raise metabolism with thyroid for short periods are the diffuse colloid goiter of adolescence, anorexia nervosa and certain pituitary disturbances.

Three cases of nephrosis in which thyroidin proved valuable have been reported by D. Campanacci (Wien. klin. Woch., Mar. 13, 1924). In a child of 3 years who had had general edema for months, 0.5 Gm. of thyroidin daily for 10 days resulted in an increase of urinary output to several times the original amount, with complete disappearance of edema and albuminuria. In a woman of 48 with 5 per cent. of albumin, anasarca, and basal metabolism -30, the drug brought about retrogression of all the symptoms in 2 months. A dosage of 0.3 Gm. (5 grains) a day was continued for 3 months. The writer regards the value of thyroid in some cases of nephrosis as definitely established.

On the other hand, Kollert and Susani (Wien. Arch. f. klin. Med., Oct. 15, 1924) did not find thyroidin alone effective in every case, but noted that thyroidin and urea acted well together—the latter in large doses, up to 120 Gm. (4 ounces), given usually at intervals varying from once weekly to every other day.

[See also Goiter and Goiter, Toxic.]

TINEA. See RINGWORM.

TOLYSIN.—From experimental work in dogs, H. G. Barbour and E. Lozinsky (Jour. of Lab. and Clin. Med., Jan., 1923) concluded that tolysin (the ethyl ester of paramethylphenylcinchoninic acid) seems to be the least toxic of all substances of demonstrated antirheumatic efficiency. It exhibits the peculiarity that the maximum limit of its absorption from the intestine coincides essentially with full therapeutic doses. Cumulation being evidently absent, indefinitely large amounts could be given to dogs without any toxic effect.

TONGUE.—FUNGUS.—A case of infestation of the tongue with Aspergillus niger, seen by D. MacFarlan (Laryngosc., Sept., 1924), proved resistant to successive measures for 2 months, until the tongue was smeared with a heavy solution of glycerite of tannic acid, immediately followed by a 25 per cent. solution of silver nitrate. With a later 2d application, and scraping with a knife, the fungus became detached and the condition cleared up in 2 weeks.

CANCER.-According to I. N. Crow (Jour. Iowa State Med. Soc., July, 1924), the best procedure in lingual cancer is the 2-stage operation followed by X-ray and radium radiation. If the cervical nodes are involved, the 1st operation is a block dissection on the primary side with removal of the submaxillary and superior deep cervical glands on the other. If the cervical nodes are not involved, the 1st operation consists in resection of the submental, submaxillary and superior deep cervical glands on the primary side. About 10 days later the primary lesion is excised, preferably by cautery and penetrating 11/2 to 2 centimeters into normal tissue.

In cancer involving the base of the tongue and adjacent structures A.

Soiland (Jour. Amer. Med. Assoc., Aug. 9, 1924) recommends buried radium. It is also useful to apply large radium packs under the chin externally and to crossfire from behind the angle of each jaw. enough radium is not at hand for the purpose, the X-ray can be used to good advantage. N. Patterson (Arch. d'électr. méd., Sept., 1924) deems the results of diathermocoagulation much superior to those of surgery. He reports 18 cases of cancer of the tongue, palate, pharynx, tonsils, pillars, or floor of the mouth, some inoperable, in all of which cure was obtained without recurrence during periods of observation of from 11/2 to 8 years. Ligation of the arteries supplying the growth is advised to prevent hemorrhage when the necrotic tissue is separating. The cervical glands should be dealt with surgically after the diathermic procedure.

TONSILS, - ABSCESS. - The method of evacuation of peritonsillar abscess described by R. S. Irvine (Cal. State Jour. of Med., Sept., 1923) is asserted to be advantageous as regards accurate localization of the abscess, safety and thoroughness of evacuation, minimum damage to the pillars and palate, and painlessness. With the patient lying with the face turned toward the affected side, a small mouth-gag is introduced and general anesthesia instituted. anesthetic mask is then removed, the jaw quickly opened with the mouthgag, and the position and type of abscess ascertained with the finger. A sponge-holder is next placed behind the swelling, and blunt tonsil scissors, curved to a right angle, passed between the tonsil and anterior pillar and the abscess cavity entered. The pus is evacuated by separating the blades as widely as required, and is kept from entering the larynx by the sponge and by voluntary action of the patient, now sufficiently awake to clear his throat. Upon failure to reach pus, the blunt point may be used for exploration. Two or 3 weeks later tonsillectomy is performed.

ACUTE TONSILLITIS.—According to A. L. Bloomfield and A. R. Felty (Arch. of Int. Med., Oct., 1923), acute follicular tonsillitis is nearly always, if not invariably, an infection with the beta-hemolytic type of streptococcus. They regard it as a specific streptococcus disease in the sense, e.g., of erysipelas. The disease is not, as a rule, an autogenous infection, but occurs in persons not already carriers of hemolytic streptococci. Following the acute disease, the organisms persist for an indefinite time in the tonsils. In cases seen by the writers in persons already tonsillectomized, the local reaction merely affected bits of remaining lymphoid tissue, but the severity of the general reaction did not seem especially mitigated by the absence of the bulk of the tonsil tissue. Nevertheless, the tonsil removal does make more difficult the invasion of hemolytic streptococci in the throat. C. C. Young and M. Crooks (Jour. of Lab. and Clin. Med., Mar., 1924) recommend a standard blood plate for the differentiation of throat infections. wide distribution of hemolytic streptococci does not impair the diagnostic value of finding streptococci in practically pure culture.

**PROPHYLAXIS.**—Prophylactic vaccination is deemed rational by Bloom-

field and Felty (Johns Hopk, Hosp. Bull., Aug., 1923) because they observed a far lower incidence of acute tonsillitis in a given 6-month period among persons who were carriers of beta-hemolytic streptococci in their tonsils than among non-carriers. A polyvalent vaccine was prepared from 21 strains of beta-hemolytic streptococcus from cases of acute follicular tonsillitis, and 3 doses of 75,000, 100,000 and 125,000 were given subcutaneously at weekly intervals to 18 out of 57 non-carriers. Among the 18 vaccinated there later occurred only 3 cases of very mild tonsillitis, as against 12 severe cases among the 39 unvaccinated.

According to these observers the prophylaxis of tonsillitis also calls for avoidance of crowding of persons in small closed rooms. In dormitories or barracks the beds should be spaced widely.

TREATMENT.—According to Felty, the best treatment for acute tonsillitis consists of rest in bed, free ingestion of fluids, and the frequent use of a bland wash, such as normal saline solution. He disapproves of local mechanical manipulations such as irrigation of the crypts, on the ground that a general septicemia may result.

J. Flesch (Wien, klin, Woch., Aug. 7, 1924) maintains that the smaller the volume of fluid swallowed at 1 time in tonsillitis the greater the pain, as the muscles of the tongue, palate and pharynx are obliged to contract more in "empty" swallowing. Fluid can be swallowed with but little pain if the mouth is 1st filled with the fluid to its full extent, the head next bent slowly backward (causing occlusion of the larynx by

1

the base of the tongue), and all of the fluid then swallowed at once.

CHRONIC TONSILLAR DIS-**EASE.**—Investigating the relations between tonsillitis and various rheumatic disorders or acute hemorrhagic nephritis, S. H. Mygind (Acta oto-laryng., vi, 335, 1924) arrived at the conclusion that chronic, not acute, tonsillitis, is the exciting condition underlying these associated disorders. Acute tonsillitis often appears at the same time with or even several days later than the rheumatic fever, erythema nodosum, etc., and cannot therefore properly be looked upon as the initial event or cause. One of the most characteristic symptoms of chronic tonsillitis, he believes, is the long period of lassitude usually complained of before the onset of rheumatism. Adenoid tissue in the tonsillar region shows the greatest development at the juncture in life at which rheumatic fever is commonest. Among the 22 cases of nephritis, acute tonsillitis was elicited in 55 per cent. and chronic tonsillitis in 36 per

TREATMENT.-J. Daland (Atlantic Med. Jour., Jan., 1924) advises complete surgical removal for chronic tonsillar infection or an infected remnant. If the infected tonsils are inoperable, division of the septa of the crypts may be performed to promote drainage. The crypts, after being thoroughly emptied by compressed air or liquid, may be irrigated with some antiseptic solution. The size and infectivity of diseased tonsils can sometimes be reduced with the X-ray applied in proper doses at proper intervals; this treatment should be used in conjunction with local treatment. In healthy young adults, without complications, vaccines are usually unnecessary, but in the senile, the debilitated, and those with poor resistance, a properly made autogenous vaccine is of value.

Many articles have appeared in recent years on the X-ray treatment of the tonsils. A. L. Yocum, Jr., (Jour. of Radiol., Jan., 1925) deems it proven that there is no danger to the lymphatics, thyroid, pituitary or other tissues from such treatment, and finds that after 4 to 6 weeks of exposures the tonsils begin to The highest degree of imatrophy. provement is reached at the end of 6 months. He uses a 10 in. spark-gap and the equivalent of 6 mm. of aluminum as filter. The patient lies prone, with the head turned to 1 side; the lobe of the ear is held aside with adhesive plaster and the ray is centered below the ear at the angle of the jaw, striking the tonsil. After 2 exposures, purulent or watery material exudes from some of the crypts, and is readily expressed by making pressure with 2 wooden tongue depressors in front of and behind the tonsil. Any white or yellow sealed spots on the tonsil may be punctured with a sharppointed knife. Six to 8, or at most 12 exposures are required.

W. D. Witherbee (Jour. of Ophth., Otol. and Laryng., Nov., 1924), having treated over 2000 cases, asserts that after 2 months' treatment the tonsils and adjacent lymph structures are reduced to a firm, fibrous mass. and that of cases of pharyngitis and tonsillitis thus treated 80 per cent. have been free from recurrent attacks for 2 to 3 years. He advocates X-ray treatment in cases in which an anesthetic or operation is contraindicated, in arteriosclerotics, where hemor-

rhage may cause complications, where the tonsils are so imbedded in infected tissue that operation might cause septic embolism, when there is marked infection in nearby lymphatic structures, in chronic cardiac or renal disease, in any condition that has lowered general resistance, in patients subject to peritonsillar abscess, and in those with recurrent attacks of pharyngitis after removal of tonsils and adenoids.

Enthusiasm for the X-ray method is by no means universal. B. R. Shurly (Jour. Amer. Med. Assoc., Sept. 8, 1923) deems the procedure mainly indicated in patients who are bad operative risks or will not consent to tonsillectomy, and in the hysterical, neurotic, or senile. The reduction in size of hypertrophied tonsils in his experience has been about 50 per cent. Even after treatment, purulent and cheesy material could be expressed from the crypts, and infection remained on expression about the pillars. He states that microscopic examination has shown no atrophy of lymphoid tissue from the X-ray treatment, nor any increase of fibrous tissue.

C. A. Simpson (Amer. Jour. of Roentgenol., Dec., 1924) states that where tonsils receive X-ray treatment alone, definite masses of lymphatic tissue are seen in the tonsillar fossæ. He prefers radium, and in adults and older children uses a small radium plaque, the open window of which is held directly against each tonsil for 30 minutes, a dental suction tube carrying off the saliva. One treatment reduces the average tonsil as much as 4 or 5 X-ray exposures, and ordinarily only 3 radium treatments are required. In adults with

sensitive throats, in children or where quick results are desirable, he inserts radium emanation seeds—usually 2 in number, at least 0.5 cm. apart—into the tonsil, after application of 2 per cent. cocaine solution. After 1 to 3 treatments, complete atrophy and disappearance of the tonsillar tissue results.

A method of tonsillectomy under local anesthesia asserted to be both simple and effective has been described by H. Dintenfass (Ther. Gaz., Mar., 1925). A hypodermic injection of morphine sulphate, 1/4 grain (0.015 Gm.), and atropine sulphate,  $\frac{1}{150}$  grain (0.0004 Gm.), is given about  $\frac{1}{2}$ hour beforehand. The tonsils and surrounding area are swabbed with 1/2 strength iodine solution. The needle used in injecting the anesthetic solution is of the screwthread type and only 1/2 inch long but with heavy walls and a large bore. It is inserted just below the middle of the tonsil, at a point between the tonsil and the anterior pillar. The direction of the needle is at first toward the angle of the jaw on the same side, but as the fluid is injected the needle is directed toward the median line, and is practically pushing or lifting the tonsil out of its bed. The anesthetic consists of ½ ounce (15 c.c.) of 0.5 per cent. procaine solution with addition of 2 drops of 1:1000 adrenalin solution. One to 2 drams (4 to 8 c.c.) of this suffices for each tonsil, which, upon proper injection of the solution, bulges into the throat. Anesthesia is immediate. The tonsillectomy is carried out with a 4-pronged tenaculum and Tyding snare passed over it, together with the Harris dissector, which cuts all the tissues seen holding the tonsil before the snare is tightened. Any bleeding is controlled by gargling ice water, a gauze plug, the Kelly hemostat, or rarely, a ligature. The shock is practically nil, the patient walking to his bed or couch without assistance.

TRACHEOTOMY.—L. H. Clerf (Surg., Gyn. and Obst., Apr., 1924) warns against general anesthesia in tracheotomy. He quotes Chevalier Jackson's statement that pneumonia is 1 of the rarest complica-

tions following tracheotomy. An apparent pneumonia, suggested by impaired expansion and resonance, diminished or suppressed breath sounds over 1 or more lobes, many râles, rapid pulse and respiration, and fever, is dispelled by bronchoscopic removal of crusts and secretions. Dyspnea may also be due to an ill-fitting or improperly placed cannula. In any case of dyspnea not relieved by changing to a properly fitted, clean cannula, bronchoscopy should be done. A bronchoscope and mechanical aspirator should be at the bedside of every tracheotomy case. In the total absence of the cough reflex often seen in children after tracheotomy, the patients will all die unless the secretions are removed mechanically. The author reports a case of this type, with obstruction due to secretions on account of a peanut in the right bronchus, in which 17 life-saving bronchoscopies through the tracheotomy opening were done within 104 hours, the patient eventually making a complete recovery.

TRACHOMA. See Conjunctivitis, Granular,

#### TRANSFUSION OF BLOOD.

-For the purposes of transfusion, according to A. W. H. à Court, G. Bell and A. H. Tebbutt (Med. Jour. of Austral., Oct. 27, 1923), at least 3 voluntary donors should be secured and tested. The fingers of the patient and donors are pricked and 5 drops of blood taken into a test-tube containing about 5 c.c. of citrated salt solution (0.5 per cent. sodium citrate in 0.85 per cent. salt solution). From each person also about 1/2 a Wright's capsule of blood is collected. The test-tube is shaken and constitutes the corpuscles, while the capsule supplies the serum. One drop of the patient's serum is added to 1 drop of each donor's corpuscles on separate slides and, reciprocally, 1 drop of each donor's serum is added to 1 drop of the patient's corpuscles. A small glass rod is used to mix the drops and the slides are gently rocked between the fingers to hasten the clumping. Agglutination is generally readable with the naked eye, but the final reading should be taken after 10 minutes with a low-power microscope or hand lens. Complete compatibility is shown by absence of agglutination by each procedure between the bloods of the patient and donor; partial compatibility for transfusion purposes, by agglutination of the patient's corpuscles by the donor's serum but not the converse, and incompatibility, by agglutination of the donor's corpuscles by the patient's serum.

P. Levine and J. Mabee (Jour. of Immunol., Nov., 1923) demonstrate that a socalled "universal donor" may at times be dangerous, and deem it safer to use the direct test than to depend upon such a donor. In Coca's direct test they recommend that the donor's citrated blood be diluted with saline solution 2:10 instead of 1:10 before being mixed with the equal volume of the recipient's citrated blood. P. Martin (Siglo méd., Dec. 15, 1923) states that if urgency does not permit determination of the patient's blood group, 20 c.c. of the donor's blood may 1st be cautiously injected, and the injection then continued if no untoward effects occur.

A new, rapid method of transfusion has been described by W. A. Norton (Surg., Gyn. and Obst., July, 1924), which requires no preparation save the sterilization of a Luer syringe, a drop of iodine on the arms of the donor and recipient, and a 2-Gm. ampule of sodium iodide. One-half the contents of the ampule is drawn into the syringe while it is still hot, next 75 c.c. of blood withdrawn from the donor into the syringe, the syringe then shaken rapidly while passing from donor to recipient, and the contents injected directly into the recipient's median-basilic vein through the needle. The procedure is at once repeated, the remainder of the iodide ampule being used for the 2d injection. The blood is never exposed to the air, and the time of transfusion reduced to less than 5 minutes.

C. Flandin and A. Tzanck (Bull. Soc. méd. des hôp. de Paris, Oct. 17, 1924) consider arsphenamin superior to all other anticoagulants for transfusion, including sodium citrate. In 2 cases of abundant hemorrhage in typhoid fever they had excellent results from transfusion of 320 and 250 c.c. of blood mixed with 0.03 Gm. of sulpharsphenamin per 100 c.c.

In 50 cases of transfusion in infancy, D. M. Siperstein (Minn. Med., Oct., 1924) has

successfully carried out intraperitoncal transfusion of citrated blood (10 c.c. of fresh 2 per cent. citrate solution to 100 c.c. of blood), strained through gauze and at once injected by abdominal puncture. The recipient's and donor's bloods are grouped beforehand as usual. The reactions seem less severe than after the intravenous method. The procedure gave good results in anemias, and is especially valuable in the period of life in which the anterior fontanelle is already closed and direct exposure of a vein is still difficult or impossible.

TRICHINOSIS.—In 7 cases of trichinosis treated by M. Algora y Nieto (Siglo méd., Feb. 16, 1924) with intravenous injections of 0.45 Gm. of neoarsphenamin, prompt recovery took place after 1 to 3 injections.

TRYPANOSOMIASIS.—In cases in the 1st stage, M. Blanchard and J. Laigret (Ann. de l'Inst. Pasteur, June, 1924) give 6 fortnightly subcutaneous injections of atoxyl in doses of 0.015 to 0.02 Gm. (1/4 to 1/3 grain) or even more per kilo. of body weight. Usually 5 intravenous injections of tartar emetic are interpolated between the atoxyl injections. Excellent results are obtained, and of 100 cases 67 remained seemingly cured after 3 years, without any untoward nervous effects. Ouzilleau and Lefrou (Ibid., Mar., 1923) note that the essential point is to cure the 1st stage and not allow the 2d to develop. All of their 6 cases of injury to the eyes by atoxyl were in the 2d stage.

Good results with Bayer 205 are reported by F. K. Kleine and W. Fischer (Deut. med. Woch., Aug. 10, 1923). The drug was given subcutaneously in doses of 1.2 Gm. (18½ grains) in 5 c.c. (80 minims) of salt solution 3 times at intervals of 10 and 18 days. Of 30 new cases treated,

only 2 had an early fatal ending, though some months later 3 severely ill patients succumbed.

H. J. Morgan (Amer. Jour. Med. Sci., June, 1924) reports a case in a woman missionary who had a clinical relapse with manifestations of recurrent encephalitis subsequent to treatment with Bayer 205. Immediate improvement followed intravenous injections of 2 to 3 Gm. (30 to 45 grains) of tryparsamide in sterile distilled water at weekly intervals, and the patient was symptom-free when discharged.

TRYPARSAMIDE, See under Arsphenamin.

TUBERCULOSIS, PULMO-NARY.—DIAGNOSIS.—S. A. Slater (Jour.-Lancet, July 15, 1923) divides the conditions most likely to be mistaken for tuberculosis into those with suggestive symptoms but physical signs lacking, and those with rather definite signs but lacking in symptoms. In many instances prolonged study and laboratory tests are required before the correct diagnosis is reached. Hyperthyroidism is probably the commonest example of the 1st group; tremor and the Goetsch test or a 5-grain (0.3 Gm.) dose of thyroid extract usually clears up the diagnosis. In the 2d group, most of the conditions are confused because of cough and expectoration. In these, the base of the lung is more often involved than the apex. A patient expectorating profusely but with sputum negative on thorough examination usually has some other disease. In the 2d group, bronchiectasis and malignant disease are the most frequent source of error. In the former the patient is generally well nourished, the physical signs are usually in the angle of the scapula, and the fingers are often clubbed. Mycotic conditions are often overlooked; blastomycosis apparently has some predilection for the vicinity of Chicago, coccidioidal granuloma for California, and sporotrichosis for the Mississippi River Basin.

According to F. H. Heise (Amer. Rev. of Tuberc., Nov., 1923), moderate changes in breath sounds are too frequent in clinically negative cases to be of value. In the case of moderate bronchovesicular breathing the chance of error is about 50 per cent. Distant or exaggerated breathing was accompanied by a diagnosis of clinical tuberculosis in 67 per cent. of cases. Negative physical findings are of no greater value than bronchovesicular breathing; clinical tuberculosis was diagnosed in 60 per cent. of cases with unchanged breath sounds and no râles, while about 50 per cent. showed definite parenchymatous X-ray changes. Moderately coarse râles in the upper portion of the lung are the only reliable auscultatory sign, unless the changes in breathing are very marked. presence of râles, however, does not always mean tuberculosis.

Pottenger (Med. Jour. and Rec., Feb. 20, 1924), describing the diagnostic utility of reflexes from the lung, states that while acute pain is rarely present as a reflex, there is some irritability and discomfort, and also changes in touch, heat and cold perception which are transmitted to the tissues covering the neck and upper portion of the chest, above the 2d rib anteriorly, and those between the occiput and spine of the scapula posteriorly. Trophic reflexes, with thinning out and atrophy, are also often evident in these locations. T. A. Groover, A. C. Christie and E. A. Merritt (Radiol., Sept., 1924) have seen cases with shoulder pain as the only symptom. Such pain, when not otherwise explained, should direct attention to the chest. As seen by X-ray in such cases, the disease usually extends high up in the apex and frequently well out to the periphery toward the axilla. Definite thickening of the apical pleura can often be made out.

Goudman-Benstz (Ned. Tijd. v. Gen., Mar. 15, 1924) found regional tenderness of the muscles in 49 per cent. of 520 incipient cases. Twitching of the local muscle fibers was pronounced in 37 per cent. Auricular tenderness was marked in 14 per cent.; in 13 of the 49 positive cases only the auditory canal was tender.

Temperature records are of value in doubtful cases, according to C. G. R. Goodwin (Tubercle, Sept., 1923), only if taken 4 times a day for 2 or 3 weeks. In health, the rectal temperature should not be above 97.8° F. at 7 or 8 A.M., nor above 99° F. in the evening, during rest. Whereas, in health, the temperature is raised to 100.2 or 100.4° F. by an hour's walk of 4 miles, and subsides to 99° after an hour's rest, in tuberculosis it may rise to 101° or more, or may fail to subside to 99°. A marked exacerbation of temperature at or just after menstruation is of grave significance. An early evidence of active processes in the apices and interlobar fissures, according to P. De Michele (Tubercolosi, Jan., 1924), is elicited in that, if the temperature of the 2 axillæ is taken for 10-minute periods every 2 or 3 hours, it will always be found somewhat higher on the affected side. When the process is tending to become latent or heal, this inequality of temperatures is 1 of the first signs of improvement.

According to A. Schick (Wien. klin. Woch., May 3, 1923), auscultation of the mouth never elicits râles in incipient tuberculosis, but does so later when there are cavities, however deeply situ-This is therefore a rapid procedure for finding out the extent of the disease. H. Maendl (*Ibid.*, July 5, 1923, and May 1, 1924) notes that patients examined at the height of the menses show an exaggeration of auscultatory findings which is serviceable in early diagnosis of the disease. Râles are heard over parts of the lungs previously silent in this respect. In 77 per cent. of cases study during the menses gave complete information as to the nature and extent of the lesions.

P. Sterzi (Tubercolosi, Nov., 1923) describes a marked progressive dilatation of the heart occurring as a premonitory sign for 3 to 5 days previous to hemoptysis, and advises that a consumptive's heart be examined every morning in order to be able to detect the earliest evidence of dilatation and take suitable measures to stimulate the cardiopulmonary circulation. This cardiac dilatation occurs oftenest in the fibrocaseous type of case with emphysema and high blood-pressure.

Induced anisocoria (Sergent's test) was used with good results by Z. F. Fanelli (Rif. med., Oct. 15, 1923) in 20 tuberculous cases and 6 controls. Two drops of 0.1 per cent. atropine solution are instilled in each eye and the pupils observed at 1-minute intervals for unequal dilatation. Mydriasis uniformly occurred more promptly on the side of the lesion, and in bilateral

cases, on the side of the more active process. The test is usually negative where the lesions are old and fibrotic. W. Jullien (Ann. de méd., Feb., 1924) substitutes 4 per cent. euphthalmin solution for the atropine. The mydriasis begins in 10 minutes, reaches its height 20 or 30 minutes later, and passes off within 24 hours. In 61 cases of unilateral tuberculosis the writer found spontaneous anisocoria in 26 per cent., and in 45 per cent. more, anisocoria was elicited by this test. The lesion need not be situated in the apex to produce anisocoria.

SPUTUM.—The following method for rapid staining of tubercle bacilli is described by E. C. Thistlethwaite (Tubercle, Sept., 1924): Two layers of ordinary or 3 of liquid sputum are spread, and the films dried and fixed by heat. They are next stained with carbolfuchsin and heat for 6½ minutes, decolorized with 10 per cent. sulphuric acid for 5 minutes, and counterstained with saturated picric acid or methyl-green. The method saves several minutes of time as compared to the Ziehl-Neelsen, and, on an average, showed 8 times as many tubercle bacilli.

An effective concentration method for sputum examination is recommended by P. M. Andrus (Can. Med. Assoc. Jour., July, 1924): The material is dissolved with 1 or 2 volumes (according to viscosity) of 0.5 per cent. NaOH solution in a water-bath at a temperature not to exceed 70° C.; this is usually effected within 1/2 hour if the specimen is vigorously shaken at intervals. Three per cent. of chloroform is then added and the mixture shaken vigorously for 20 minutes (most conveniently with a mechanical shaker). Finally, the mixture is centrifugated fairly rapidly for 20 minutes, the supernatant fluid pipetted off, and smears made from the sediment. The entire sediment from a several-day specimen may thus usually be placed on 2 or 3 slides. Among clinically tuberculous subjects in whose sputum bacilli had never been found in from 10 to 40 direct method searches, 58 per cent. were positive by this procedure.

A. Zuppa (Rif. med., Sept. 3, 1923) endorses the diagnostic significance of acid-fast fuchsinophile corpuscles in tuberculous sputum. The specimen is stained with carbol-fuchsin and heat for 2 minutes, decolorized with 20 per cent. alcoholic solution of lactic acid for 2 minutes, and counterstained with either methylene-blue or picric acid. The small corpuscles represent a separate lytic stage of the tuberculous virus, as yet not well understood, and seem to be an expression of strong resistance on the part of the patient.

FECES.—E. Sergent and H. Durand (Médecine, May, 1923) urge examination of the stools for tubercle bacilli when sputum is not available, as in children. Many adults likewise swallow their sputum. The procedure consists in making a suspension of 50 c.c. of feces in 0.07 per cent. sodium chloride solution, filtering through gauze, filling 2 centrifuge tubes 3/3 with the suspension, adding 2 c.c. of a mixture of equal parts of ether and ligroin to each, shaking thoroughly, and centrifugating for 10 minutes. F. G. Chandler and Slobo (Tubercle, Sept., 1924) strongly advise examination of the feces for bacilli where the latter cannot be found in the sputum. M. Fried (Boston Med. and Surg. Jour., May 10, 1923) found that out of 23 cases in which the sputum was negative the feces were positive in 3.

RADIOGRAPHY.—R. W. Matson (Northw. Med., Jan., 1924) notes that in quiescent cases, which are frequently diagnosed as chronic bronchitis, this procedure affords full information; likewise in unilateral cases, where it is often difficult to decide whether the signs on the healthy side are due to compensatory changes or to extension of disease. In the early diagnosis of tuberculosis, the interpretation of stereoscopic plates by an expert is far superior to physical diagnosis in the hands of the average clinician.

According to L. B. Crow (Amer. Jour. of Roentgenol., Sept., 1923), non-involvement of the glands in the posterior mediastinum is of great value in eliminating suspected pulmonary tuberculosis. The patient stands at an angle of 45° with the left scapula

resting against the fluoroscope and the right shoulder touching the screen; he may be variously rotated in order to obtain the maximum amount of space between the heart and spine. The involvement in positive cases ranges from narrow lines or a distinct chain of glands extending from the upper portion of the space to the hilus region to a darkening of the whole field. It is an early sign.

SERODIAGNOSIS.—Numerous contributions have been appearing on the complement fixation test. T. Hansen and C. H. Würtzen (Hospitalstid., Mar. 26, 1924), using Besredka's antigen, obtained a positive reaction in 37.9 per cent. of 106 patients in the 1st stage of tuberculosis, 71 per cent. of 49 in the 2d stage, and 84.4 per cent. of 185 in the 3d stage. B. M. Fried (Amer. Rev. of Tuberc., Apr., 1924) maintains that a positive result with this antigen indicates with rare exceptions an active focus somewhere in the body.

Quite contradictory conclusions have been published by different observers regarding the diagnostic value of Wassermann's complement fixation test for tuberculosis. H. Kalcher and A. Sonnenfeld (Zeit. f. Tub., July, 1924) assert that in their experience the positive Wassermann test nearly always indicated active disease.

S. A. Petroff (*Ibid.*, Nov., 1923) states that the complement fixation test has only confirmatory value, and cannot be compared with either the X-ray or the physical findings. Again, R. A. Kilduffe (Amer. Rev. of Tub., Apr., 1924) applied the test with Kolmer's quantitative method in 104 cases, and concluded that when properly interpreted in conjunction with the clinical data, this method may be of decided value as a diagnostic and especially as a prognostic aid in moderately and far advanced cases, not so much to the trained specialist as to the general practitioner.

TUBERCULIN TESTS.—Finding that the Pirquet test sometimes failed to show a positive response although tuberculous infection was practically certain, H. Grass (Beitr. z. Klin. d. Tub., May 25, 1924) developed a modified technic which yields about 15 per cent. more of positives and greatly reduces the number of ambiguous results. A small piece of sandpaper of

medium coarseness is folded twice crosswise, making a sharp edge, which is drawn with a quick, firm stroke over the skin of the arm, or of the sternum in infants, previously cleansed with alcohol. A small portion of cotton saturated with tuberculin is placed over the abraded surface and covered over with a piece of non-irritant adhesive plaster. This method also has the advantage of dispensing with instruments, of which so many children are afraid.

ERYTHROCYTE SEDIMENTATION **TEST.**—This test, which is applicable in a variety of disorders, is discussed under BLOOD (q.v.). W. H. Morriss (Amer. Rev. of Tub., Dec., 1924), applying it in 150 cases, found a definite increase of the rate of sedimentation in active tuberculosis. He could observe no constant relation between it and the extent of the pulmonary lesion, although rapid sedimentation did occur in a far greater percentage of cases with extensive disease. The test has little diagnostic value, but seems to offer a valuable estimation of the degree of activity. Cases judged to be quiescent usually give readings within normal limits. F. Junker (Beit. z. Klin. der Tub., July 16, 1924) deems serial tests of value in the prognosis, affording a good index of the tendency to healing, as well as a valuable control of special measures such as tuberculin therapy and artificial pneumothorax. I. Mende (Zeit. f. Tub., Sept., 1924) states that if the sedimentation rate increases during tuberculin treatment, the latter should be stopped. R. Wachter (Deut. med. Woch., May 23, 1924) finds the test helpful in the diagnosis of bronchial gland tuberculosis when X-ray and other indications are dubious.

TREATMENT.—As a procedure for accentuation of the favorable influence of rest in tuberculosis, complete immobilization was resorted to by S. Swezey (Colo. Med., July, 1923) in 11 cases that had proved refractory to all other treatment, with good results. The object of the method is to minimize the access of the general circulation to the focus of disease. The patient is kept lying

flat on his back, perfectly relaxed, most of the time, only occasionally being allowed to turn from side to side, and that only with the aid of the nurse. Reading is interdicted and complete mental relaxation required. This is continued for at least a month after all symptoms of toxemia have subsided, and then discontinued very cautiously, according to a definite graded scheme.

Few cases are not benefited by controlled diaphragmatic breathing, according to S. A. Knopf (Amer. Rev. of Tub., June, 1924), who describes it as a substitute for artificial pneumothorax. The patient voluntarily reduces the number of breaths to 10 a minute and makes them of the diaphragmatic type. When not using this procedure he should practice shallow breathing. He is urged to sleep on the affected side, and chest motion may be further restricted with sandbags, etc. Massage of the limbs and light massage over the chest, abdomen and back are of use in afebrile cases.

In regard to diet, J. G. Hislop (Lancet, Aug. 4, 1923) warns that no dyspeptic patient should be required to take an excessive amount of food. Milk should be given in moderation, and addition of sodium citrate will often overcome difficulty of assimilation. Mixtures of proteins with fats in liquid form should be avoided. Meats are better cooked in their own juices. Milk should not be given with meals at which meat is served. Fish should not be fried in oils. The fat with meat, e.g., bacon, should be crisped. Carbohydrates should be served at meat meals. Diluted nitrohydrochloric acid should be given in doses of 10 to 30 minims (0.6 to 2 c.c.) before or during each meal as a salivary stimulant and to supply the stomach with acid. Liquid petrolatum with agar is used in order to obtain regular defecation.

According to H. Barbier (Bull. Soc. de péd. de Paris, Feb.-Mar., 1924), the general hygienic treatment of tuberculous children may be markedly reinforced by the use of tincture of iodine, of which he gives 10 drops daily (10 per cent. tincture) per year of the child's age. The drug is well borne, and always increases the large mononuclear cells.

Intravenous calcium chloride injections have been found valuable in 200 cases of tuberculosis by L. A. Rosen, according to L. Cheinisse (Presse méd., Sept. 20, 1924). The average dose per injection is 300 c.c. (10 ounces) of a 1 to 1.5 per cent. solution. C. P. crystalline calcium chloride is used, dissolved in carefully distilled water. If the solution is acid, freshly prepared calcium hydroxide is added until it is slightly alkaline. The solution is sterilized by boiling and sealed in flasks, but should be as fresh as possible when used. The rate of injection should not exceed 15 to 20 c.c. a minute. The course of treatment consists of 2 series of 15 injections each, with a 10-day interval; the injections are generally given every other day. The typical result is an increase of weight in the 2d week, with improved heart action. Fever, sweats and cough subside, and the tubercle bacilli disappear by the end of the 3d month. The physical signs persist longer. Milk and green vegetables are pushed throughout, and calcium salts are also given by mouth. Recurrences were noted only in 30 cases in the 1st 3 years after apparent recovery; a 2d course of injections under these conditions yields more permanent results. The method is poorly borne and much less effective in advanced

cases with mixed infection and extensive tissue destruction.

A method of calcium inhalations from a special apparatus is described by G. Angiulli (Tubercolosi, Mar., 1924) which is stated usually to arrest or cure the tuberculous process. P. S. Pelouze and R. C. Rosenberger (Amer. Jour. Med. Sci., Oct., 1924) gave tuberculous and nontuberculous guinea-pigs calcium and parathyroid substance separately and combined, and found the lesions less marked in the animals receiving parathyroid with or without calcium than in the controls. The tuberculous animals receiving both drugs ate far more and gained more weight than the others. Brief experience with the drugs in 9 advanced cases in man showed such a striking change from the earlier weight losses that the matter seems worthy of further study.

Sodium morrhuate was used by P. W. R. Boelke (Brit. Med. Jour., Dec. 29, 1923) in 14 cases, and is stated to have proven valuable even in the advanced stages. A 3 per cent. solution was used, with 0.5 per cent. of phenol, and sterilized in the autoclave. The initial dose for subcutaneous or intramuscular injection was 0.1 to 0.2 c.c.  $(1\frac{1}{2})$  to 3 minims), and this was increased by 0.1 c.c. at intervals of 3 to 5 days unless there was a reaction. The writer deems this treatment the best for ambulant cases, and asserts that it can arrest the disease after tuberculin and sanatorium treatment have failed. J. Hume (Lancet, July 26, 1924) also found sodium morrhuate of great help in advanced cases, while in early cases it seemed completely to arrest the disease.

Sulpharsenol or arsphenamin, preferably intramuscularly, is considered valuable by J. Guy and G. B. Page (Lancet, Apr. 26, 1924) in cases of extensive disease with some activity, where one would hesitate to use vaccines; cases which "hang fire" after sanatorium treatment; cases in young adults with anemia and loss of weight, but otherwise favorable; cases of combined syphilis and tuberculosis, and doubtful cases of lung disease, as a therapeutic test. Results are obtained more rapidly and markedly than with Fowler's solution.

Sodium aurothiosulphate (sanocrysin), recently advocated by H. Mollgaard, is stated to have the advantage over other gold preparations of being readily diffusible and slowly decomposed in the body without directly giving off toxic substances. There is, however, admittedly danger from inflammation of the lungs, heart and kidneys after its injection, which danger the sponsor claims to have reduced by the conjoint use of serum from calves or horses injected with dead tubercle bacilli. Yet, I. Snapper (Ned. Tijd. v. Gen., Dec. 6, 1924) states that deaths occur under the treatment, even in mild cases. The crucial test, viz., the cure of tuberculous guinea-pigs, has not yet been definitely established.

Minute doses of phenol intravenously were used systematically by González Troncoso (Sem. méd., Sept. 11, 1924) in 14 cases with favorable effects on the general condition and body weight.

According to Sartory, Scheffler and Pellissier (Strasbourg méd., Jan. 5, 1924), powdered mammary gland, obtained by simple desiccation of the gland without any chemical treatment, leads, in tuberculosis, to cessation of hemoptysis (including the premenstrual type) and of menorrhagia, to improved appetite and weight, and subsequently to reduction of cough and expectoration. The drug should be taken for 20 days in each month, for several successive months.

Though numerous warnings have been given against heliotherapy in pulmonary tuberculosis, H. LoGrasso and F. Balderrey (Amer. Rev. of Tub., Oct., 1924) report from Perrysburg, N. Y., very gratifying results from it, both as to general improve-

ment and decreased activity of the pulmonary lesion. The 49 cases treated were moderately advanced, with an unfavorable prognosis after thorough rest-cure. The exposures to the sun were gradually increased in 17 days from 3 5-minute periods for the feet only to 60-minute periods for all parts of the body. In summer, the exposures were restricted to the early morning and late afternoon.

For vomiting in tuberculosis, Lassablière (Médecine, May, 1923) recommends sweetened condensed milk. Benefit also followed the use of sodium citrate with codeine. R. A. Young (Lancet, Mar. 8, 1924) states that sickness after coughing up viscid sputum may often be relieved by hot milk and water or weak tea. If this fails, a mixture of sodium bicarbonate, 10 grains (0.6 Gm.); sodium chloride, 3 grains (0.2 Gm.); spirit of chloroform, 5 to 10 minims (0.3 to 0.6 c.c.), and water, to make 1 ounce (30 c.c.), will often relieve, especially if given with hot water.

Anemia in 23 advanced cases was treated by R. W. Dunham (Wis. Med. Jour., Nov., 1924) with spleen extract and bone marrow, given in capsules 3 times daily, ½ hour before meals, with marked improvement in 21 instances. Trial in earlier cases is also suggested.

In tuberculous pleurisy with effusion, Navarro (Prensa med. Argent., ix, 948, 1923) obtained good results with a salt-free diet and 10 or 15 teaspoonfuls daily of the following solution: Calcium chloride and soluble starch, of each 30 Gm. (1 ounce); lemon jelly, 100 Gm. (31/3 ounces), and distilled water, 20 c.c. (5 drams). Excellent effects were observed in 40 per cent. of cases, a good effect in a like percentage, and slight benefit in 20 per cent. About 3/4 of the effusion was absorbed in 5 or 10 days, and thirst was abolished.

Tuberculin.—According to Sahli (Schweiz. med. Woch., Sept. 20, 1923), intracutaneous injection of Béraneck's tuberculin is the best and least dangerous method of specific treatment. In 144 cases, H. J. van

der Weij (Ned. Tijd. v. Gen., July 26, 1924) found the Béraneck tuberculin the most effective of several forms employed, including the partigens (partial antigens) of Deycke and Much. Tuberculin is most effective when producing little or no reaction. The dilutions of Béraneck's H used by the writer range from 1:10,000 to 1:100,000. The 1st 5 injections are 0.1, 0.2, 0.3, 0.5 and 0.7 c.c., while in the next 5 the same amounts of a 10 times stronger solution are used. Injections are given weekly and later twice weekly, with the dosage gradually raised up to 1 c.c. of II tuberculin. The special indication for tuberculin is chronic localized disease. It often reduces the tendency to catarrh and improves asthma, nervous rhinitis, dysmenorrhea and other manifestations of sensitization.

According to C. Fischer (Zeit. f. Tuberk., Apr., 1924), tuberculin is most effective when pure Koch's tuberculin is injected in a 1 to 1.5 per cent. solution in the patient's **own serum.** The pyretogenic action of the tuberculin is thus eliminated, and the initial dose of 0.001 Gm. of tuberculin is repeated at longer intervals than is customary, viz., after the end of the negative phase. No harm was observed to result from this heavy dosage.

R. Philip (Brit. Med. Jour., Mar. 24, 1923) favors the percutaneous method of giving tuberculin. In most cases it interferes little with the life and occupation of the patient. The actual amount of tuberculin applied, using, c.g., a 25 per cent. dilution, is about 0.1 c.c. The ointment containing this is worked into the cleansed skin over an area of 1 or 2 sq. inches with a small sterile glass rod. This is done once weekly. The local reaction, while generally definite enough, causes little, if any, discomfort. This treatment is strongly advised at the earliest indication of chronic glandular enlargement in children.

Artificial Pneumothorax.—Of 480 cases treated in this way by R. W. and R. C. Matson and Bisaillon (Am. Rev. of Tub., June, 1924), 235 were satisfactory collapse cases, and of these, 48 per cent. are clinically well, 18 per cent. arrested and 22 per cent. dead. In 245 cases receiving only partial lung collapse, the corresponding percentages were 11, 12 and 58. Best results accrued in chronic fibrocaseous types without demonstrable excavation, when adhesions did not prevent satisfactory collapse, and with essential freedom from disease in the opposite lung. In progressive fibrocaseous cavernous types, with more destruction and widespread lesions, the results were not so good. The results obtained justify pneumothorax earlier in the course of tuberculosis than has hitherto been customary.

S. F. Blanchet (Arch. of Surg., Jan., 1925) similarly advises pneumothorax in moderately advanced cases that fail to respond reasonably soon to the usual treatment, or when, in these cases, cavities are beginning to form. Careful sanatorium treatment in addition greatly increases the chance of getting the most benefit from pneumothorax. If, after perhaps 2 or 3 years, one is doubtful as to the safety of allowing the lung to reëxpand and function again, the writer deems a thoracoplasty, which will make the compression permanent, definitely indicated.

In a case of collapse following insertion of a needle for pneumothorax, in which respiration and pulse had stopped and artificial respiration, camphor and caffeine failed, Cervini (Policlin., June 30, 1924) resuscitated the patient by intracardiac injection of 1 c.c. (16 minims) of 1:1000 adrenalin solution.

S. Golden (Amer. Rev. of Tub., Oct., 1923) maintains that in the majority of cases external thoracic compression, in conjunction with rest in bed, accomplishes as much as artificial pneumothorax, with much

less risk and discomfort. Overlapping adhesive strips 2 inches wide are started on the unaffected side 1 inch beyond the vertebral border, not so high as to pinch the axillary folds, and carried around 2 inches beyond the parasternal line of the unaffected side. With the palm of the affected side touching the head, the strips are applied at the end of forcible expiration, while pressure is made against the chest and at the same time the patient turns his body from the semirecumbent to the supine position. Strips are applied to a level 1/2 inch below the margin of the 10th rib. An inflatable jacket or pneumatic chest splint for chest restriction is now on the market.

Thoracoplasty.—From experience with the Sauerbruch operation for thoracoplastic collapse in 20 cases, A. V. S. Lambert and J. A. Miller (Ibid., Sept., 1924) conclude that about 50 per cent. of carefully selected patients, otherwise doomed to death or helpless invalidism, may be restored to satisfactory health and economic independence by this means, as well as rendered sputum-free and no longer a menace to their associates. The present mortality of about 25 per cent. may be reduced by better technic and selection of cases. The indications are: (1) Chronic fibrous cases in which artificial pneumothorax has been unsuccessful or (2) only partially successful; (3) acute unilateral lesions which have responded more or less favorably to it: (4) similar cases in which tuberculous pyopneumothorax has developed; (5) cases with successful pneumothorax in which refills are not feasible for personal, economic or environmental reasons.

E. Lehmann (Zeit. f. Tub., Mar., 1924) recommends excision of the phrenic nerve as a reinforcing procedure to either artificial pneumothorax or thoracoplasty. It is superior to simple phrenicotomy, and as a

result of it the diaphragm generally rises several centimeters. Of 10 cases, 6 were considerably improved and 3 others improved by the procedure.

Chemical Sterilization of Cavities. —In 3 cases H. P. Rankin and B. J. Weigel (Jour. Amer. Med. Assoc., Feb. 9, 1924) surgically established a fistula into a cavity. No disturbance of the chest mechanics resulted. Gentian violet solution was injected and found definitely to control the mixed infection in the cavity and to kill off most of the tuberculous infection. Methylene blue following the gentian violet seemed to act even more strongly on the tubercle bacilli, and was used freely in a 4 per cent. solution. In 1 case the cavity wall was definitely sterilized, and the other 2 cases gave promise of the same result.

# TYPHOID AND PARATY-PHOID FEVERS,—SYMPTOMS.

—The increase of typhoid incidence, ascribed to infected oysters, in New York and Chicago in 1924-1925 lends added interest to a study of 328 cases of typhoid and paratyphoid fevers by Courtois-Suffit, F. Bourgeois and R. Garcin (Presse méd., Apr. 9, 1924), who state that a considerable proportion of the cases-30 per cent. in 1920-1921—had been infected by oysters. In these cases it was observed that the incubation period was but 12 to 15 days, toxic effects particularly pronounced, complications very common (chiefly phlebitis, hemorrhage, myocarditis and meningeal reactions), and the mortality higher (17 per cent.). The oyster cases differed from the others in beginning usually with diarrhea and vomiting. In the series as a whole, deafness and tinnitus were very common at the

1

height of the disease. While relatively low at the onset, the pulse-rate was frequently 120 or 130 later in the disease, and this did not seem unfavorable prognostically, although if low blood-pressure and pronounced acceleration on the least exertion are added to it, mycarditis is likely to exist.

According to S. Suzuki (Arch. f. path. Anat., June 26, 1924), the intestinal pathology in paratyphoid fevers is sometimes merely that of a simple catarrhal enteritis. The clinical picture of sepsis with a roseolar rash may be presented by paratyphoid without involvement of the intestine. B. paratyphosus B possesses a stronger inflammatory and pyogenic action than B. typhosus. In infancy, as noted by A. Mendelsohn (Mon. f. Kind., July, 1924), paratyphoid fever is very difficult to differentiate from ordinary intestinal disturbances except by bacteriologic means.

**DIAGNOSIS.** — Marfan's tongue sign of typhoid in infants is endorsed by G. Salès and J. Debray (Nourrisson, Nov., 1924). The tongue is coated, with a red triangle at its tip.

A. B. Rosher (Lancet, July 19, 1924) emphasizes that, for the more certain diagnosis of enteric fever in subjects *vaccinated* against typhoid it is necessary to employ the method of repeated agglutination tests and thus demonstrate the well-marked fluctuation in agglutination titer considered characteristic of typhoid infections.

A milk-agar medium permitting growth of paratyphoid B and the enteritidis group, but not of typhoid or paratyphoid A is described by Hartoch and Schlossberger (Deut. med. Woch., July 4, 1924). W. Joffe (*Ibid.*) advocates a medium of peptone agar with salts from milk for para-

typhoid A, to be used in conjunction with the preceding medium for purposes of differentiation.

PROPHYLAXIS. — Studying the records of 1886 British soldiers convalescent from enteric fevers, J. A. Cruickshank (Indian Med. Gaz., May, 1924) found that efficient antityphoid inoculation greatly reduced the number of carriers resulting from those who later contracted these diseases (0.5 per cent. as against 3.2 per cent.). This suggests the advisability of vaccine therapy in uninoculated typhoid cases, in order to reduce the manufacture of chronic carriers.

Further favorable reports on antityphoid vaccination by the mouth have appeared, but the extent and duration of the resulting immunity are not as yet sufficiently known to warrant substitution of this method for hypodermic vaccination.

TREATMENT.—Little that is of outstanding value has appeared on this subject of late. A. Sauvan and C. Simonpietri (Marseille méd., Oct. 5, 1924) found, upon treating 141 cases of typhoid and paratyphoid with pyramidon, that the results as regards mortality (9.22 per cent.) and average duration (33 days) approximated those resulting from the Brandt bath method. Their procedure is to give 0.1 Gm. (1½ grains) of pyramidon every 4 or 6 hours when the temperature reaches or exceeds 38° C. (100.4° F.); no other antipyretic measures are employed. In this limited dosage the drug rarely causes uncomfortable perspiration, and no depressing action on the circulation is observed.

Intravenous injections of mercurochrome-220 soluble have been used in 12 cases by S. P. Bond and L. F. Barrier (Jour. Ark. Med. Soc., Sept., 1924). The patients' hospital stay was thereby reduced to  $\frac{2}{3}$  or  $\frac{1}{2}$  the usual period. Mild reactions with gradual decline of temperature to normal predominated, though in 1 case there was a brief rise to 108° F. The average maximum dose needed for rapid termination of fever is 20 c.c. (5 drams) of a 1 per cent. solution per 100 lbs. of weight, while the average effective dose is 15 c.c. (33/4 drams). This may or may not have to be repeated. The solution is selfsterilizing, should be freshly made, and should not be boiled. In cases with concurrent hemorrhage they inject coagulin intravenously and also 5 c.c. (80 minims) of the patient's own blood into the deltoid, and proceed with the mercurial injection in reduced dosage.

Intravenous injections of typhoid vaccine and intramuscular injections of milk were used in 48 cases by J. H. Foster (China Med. Jour., Oct., 1924). In 27 per cent. recovery by crisis occurred; in 23 per cent., a drop in temperature and recovery by lysis; in 6 per cent., a drop in temperature but no shortening of the course, and in 44 per cent., no result. Very toxic cases usually showed little response. Ceresoli (Clin. med. ital., Aug., 1924) advocates parenteral shock treatment by intravenous injection of a 25 or 30 per cent. glucose solution.

When enough milk or other nutriment cannot be given by mouth, K. C. Dutt (Indian Med. Rec., Nov., 1924) gives a **codliver oil nutrient enema** to supply necessary fat and vitamin.

In cases of hemorrhage requiring immediate transfusion, Flandin and Tzanck (Bull. Soc. méd. des hôp. de Paris, Oct. 23, 1924) give 250 or more cubic centimeters of blood, using sulpharsphenamin as an anticoagulant. [See also under Transfusion of Blood.]

**TYPHUS FEVER.**—Five cases of this disease in St. Louis have been reported by J. E. Cook (Jour. Mo. State Med. Assoc., Oct., 1924), who deems it quite clear, in this connection, that the disease was carried in successive stages from 1 individual to another. The period the infected louse remains capable of transmitting the infection is a factor in the prevalence of endemic human typhus. In none of the author's 5 cases was the patient a recent immigrant. typhoid-like disease terminating abruptly toward the end of the 2d week is very probably typhus. Usually about the 5th day an eruption appears, morbilliform rather than roseolar, but varying with the severity of the infection. The spleen is usually not palpable. There is a mild leukocytosis. Between the 12th and 15th day, or even as early as the 8th, crisis or quick lysis occurs. endemic form which is occurring in America is rarely fatal.

#### U

ULCER.—CRURAL.—Proper cleanliness locally and improved local circulation are the chief aims in the treatment of chronic leg ulcers, according to R. E. Gaby (Can. Med.

Assoc. Jour., Nov., 1924). Rest in bed with elevation of the limb is useful, if feasible. The ulcer and limb are washed with green soap followed by gasoline, ether and alcohol. If

the base is very necrotic or cellulitis exists, hot moist dressings of boric acid or Dakin's solution should be availed of. Minimum scarring calls for stimulation of epithelial growth by paraffin wax, e.g., ambrine. It is important to immobilize the granulations with wax or a splint. After healing, support should be provided.

In a case of extensive leg ulcer of long standing, Petrescu (Lyon chir., Aug., 1924) obtained cure in 3 days by an extensive periarterial sympathectomy and resection of the saphenous vein. In a number of cases of trophic or perforating ulcer, recovery followed sympathectomy in 1 to 3 weeks.

RODENT.—Analyzing 353 cases, J. F. C. Braine and G. Massie (Guy's Hosp. Rep., Apr., 1924) advise excision as soon as it becomes evident that non-operative treatment is unavailing. In the late stage, if a complete excision is impossible, diathermy is the only alternative. Great care is necessary in using this measure near the eye, lest sparking of the latter prove disastrous. In none of 138 cases subsequently traced was any tendency to metastasis noted.

VARICOSE.—To secure adequate compression over a varicose ulcer, G. Nobl (Wien. klin. Woch., June 26, 1924) uses a common rubber sponge, trimmed with scissors so that it will extend some millimeters beyond the ulcer margins. The sponge is applied over several layers of gauze and held with a bandage. Dressings of Unna's paste are also used, and often thrombosis of the varicose tributary vessels is obtained by injection of 5 per cent. phenol or 10 per cent. sodium carbonate solution. The initial bandage is allowed to remain

at least 1 week. After healing, compression bandages should preferably be continued.

UREMIA.—As a test for azotemia, M. Landsberg (C. r. Soc. de biol., Dec. 19, 1924) applies Ehrlich's reagent to the *saliva*. If more than 0.5 per thousand of urea is present in the blood a green tint is obtained.

Artificial stimulation of osmosis in the lower bowel is deemed effectual by Cardoso (Rep. de med. y cir., xv, 599, 1924) in removing uremic poisons. He gives series of 5 or 6 enemas, each of 2 liters (quarts) with a teaspoonful of sodium bicarbonate, at body temperature, to be retained as long as possible. Five minutes after each enema has been expelled another is given. This is kept up for a day or 2, a rest of 1 or more hours being allowed, however, between each series of enemas. drastic purge precedes the treatment, and the patient is given as much bicarbonated water to drink as possible. Severe uremic symptoms have subsided under this treatment, and headache in anuria is promptly relieved

According to O. P. Curti (Sem. méd., Feb. 7, 1924), the phosphoric acid in the serum is a better gauge of uremia than the urea. He found constantly an acidosis in progressive renal fibrosis. In mild uremia he uses a mixture of potassium iodide, 20 Gm. (5 drams), and sodium citrate, 10 Gm. (2½ drams), in distilled water 300 c.c. (10 ounces), given in teaspoonful doses. In more advanced cases, alkali is given intravenously.

URETHRA.—PAPILLOMATO-SIS.—In a case of papillomatosis of the penile urethra occurring in conjunction with phimosis, seen by Salleras (Sem. méd., June 26, 1924), the whole penile urethra had been destroyed as a result of these conditions. Urethral papillomas should be destroyed without delay by repeated applications of glacial acetic acid.

STRICTURE.—According to G. Praetorius (Zeit. f. Urol., xvii, 129, 1923), non-gonorrheal strictures of the prostatic urethra are not uncommon and may be the source of considerable discomfort and retention of urine, although always permeable to a relatively large catheter. The closer the stricture to the bladder, the more trouble it produces.

Béclère (Bull. Soc. de radiol. méd. de France, May, 1924) calls attention to the value of the X-ray, in conjunction with a barium preparation, gelobarine, for demonstrating urethral stricture, diverticula, and other abnormalities. After urination, 60 c.c. of a syrupy dilution of gelobarine are injected into the bladder. Frontal and lateral X-ray views are taken while the patient expels the solution. Other observers have used collargol for the same purpose.

URINE.—ACIDITY.—According to F. C. Doble (Lancet, Feb. 7, 1925), a pathologically high acidic value of the urine exists in many persons apparently in good health. This condition may prevent or hinder the healing of lesions, and upon giving alkalies proper healing will take place. In gastrointestinal toxemia there may be a temporary reduction of the hydrogen ion concentration of the urine to between 5 and 5.6, usually in conjunction with an erythematous or papular rash.

ANALYSIS.—For early diagnosis, treatment and periodic study, H. Gray (Boston Med. and Surg. Jour., Feb. 8, 1923) ad-

vocates the testing of every specimen throughout 24 hours rather than examination of a random sample or the 24-hour urine. Intermittent glycosuria often occurs at unexpected hours. Casts are found far more constantly in fresh single specimens than in 24-hour specimens, especially in diabetic urines. If study of every sample is not feasible, it is well to use a specimen collected 1 hour after a hearty meal.

BILE.—A new test for bile is described by P. Ganguli (Indian Med. Rec., May, 1924). A few drops of 3 per cent. paradimethylaminobenzaldehyde in 50 per cent. HCl are added to 5 c.c. of urine and the mixture heated to boiling. Upon carefully heating the test tube above the level of the fluid, a green film will appear on the inner surface of the tube in the presence of even only 1:100,000 of bile.

CASTS.—Masking of hyaline casts by mucus is corrected by H. L. and R. de Souza Lopes (Brazil-med., Feb. 3, 1923) by adding a little of a saturated sodium chloride solution. This releases the casts and also causes retraction of the hyaline substance. Sedimentation, after addition of some antiseptic, is allowed for 12 to 24 hours.

INCONTINENCE.—Comby (Bull. Soc. méd. des hôp. de Paris, Mar. 13, 1924) prescribes as follows in the nocturnal enuresis of children: Outdoor life, avoiding excitement and fatigue. Diet chiefly of vegetables; no heavy meals; no fluid at the evening meal. Tepid shower baths morning and evening with a dry rub; in refractory cases, cold wet packs. Atropine sulphate in 0.1 per cent. solution, 5 drops at bedtime, increased by 1 drop each night up to 10 or 12 drops; if there is also diurnal incontinence, 1 drop 3 times a day is added. If this fails, Zuber's solution of phosphoric acid (50 per cent.), 17 Gm., and sodium phosphate, 34 Gm., in water, 250 c.c.; 1 or 2 teaspoonfuls 3 times daily with the meals. A. Bauer (Zeit. f. Urol., xviii, 452, 1924) reports 2 cases successfully treated with madder. It is given in a decoction, 3 tablespoonfuls to 3 cupfuls at a dose, or as madder flour in jam or an electuary. As much as 10 Gm.  $(2\frac{1}{2} \text{ drams})$  causes no untoward effects. In children 6 Gm. (11/2 drams) may be incorporated with 150 Gm. (5 ounces) of wheat flour to make 12 zwiebacks.

According to P. Karger (Deut. med. Woch., May 16, 1924), mouth breathing, leading to thirst and habitual excessive water drinking, promotes enuresis, which yields to restriction of water intake. A useful method also is to train the child to urinate at increasing intervals during the daytime; if 4-hour intervals are reached, the enuresis usually stops. F. de Angelis (Pediat., July 15, 1923) gave injections of 0.2 Gm. (3 grains) of camphor on 1 to 6 evenings in 11 cases and obtained improvement or cure in 6. F. Viola (Rif. med., July 7, 1924) advocates epidural injections of normal saline solution.

PRESERVATION. — According to T. Brandt and R. C. Stokstad (Norsk Mag. f. Laeg., June, 1924), the best method of preserving urine specimens for later examination is acidification by addition of 1 c.c. (16 minims) of hydrochloric acid to every liter of urine.

URTICARIA.—Reactions simulating the urticaria caused by hypersensitiveness to foreign matter can be brought out, as shown by W. W. Duke (Jour. Amer. Med. Assoc., July 5, 1924), by physical agents such as light, heat, cold, freezing, burns and mechanical irritation. Diffuse reactions from exposure to heat could be prevented by application of cold to the skin or by subcutaneous injection of 0.5 c.c. (8 minims) of epinephrin.

In a case of urticaria of the lips, tongue and pharynx due to sensitiveness to white of egg, peas and lentils, Parisot and Simonin (Bull. Soc. franç. de derm., May, 1923) effected desensitization by repeated skin scarifications followed by the local application of the offending substances. G. C. Michael (Arch. of Derm. and Syph., Junc, 1924) reports good results from X-ray treatment in a case of urticaria pigmentosa in an adult, the lesions recurring, however, 1 year later.

UTERINE CERVIX.—CAN-CER.—Important summarizations of

the results of surgical and radiation treatment of cervical cancer were published in 1924. G. W. Crile (Amer. Jour. of Obst. and Gyn., May, 1924), discussing 220 cases that were available for detailed study, states that radical operations were performed in 60 of these, constituting an operability rate of 27.3 per cent. The mortality from radical operation was 6.7 per cent. Twentythree patients were heard from who were alive and well 3 years after treatment, including 16 after radical operations; 17 were alive after 5 years, including 14 after radical operation. In any case of continuous or intermittent uterine discharge of any character after the menopause, immediate vaginal hysterectomy followed by radium treatment is indicated. No curettage is permissible in these cases. A section is, however, made for microscopic diagnosis; if positive, the local growth is destroyed with the cautery, the vagina packed with alcohol sponges over night, and the hysterectomy done the next day. In inoperable cases, in view of the favorable results from radium and deep X-ray, no surgery is being done in Crile's clinic, final judgment being withheld, however, for future comparative reports as to the ultimate results.

In a collective report on 1210 cases from 22 clinics, R. B. Greenough (Surg., Gyn. and Obst., July, 1924), chairman of a committee appointed by the American College of Surgeons, notes that of 829 cases of cancer of the cervix, 94 were free from disease 3 or more years after treatment. More than ½ of these "cures" were obtained with radium and the X-ray, without radical operation. In 243

early favorable and borderline cases, hysterectomy alone cured 1 in 3, with an operative mortality of 1 in 5. Radium with palliative operationcautery—cured about 1 in 3, and radium alone, about 1 in 5. Thus, the choice of treatment in such cases is an open one. The duration of life in unsuccessful early cases is somewhat greater after radium than with operation. In more advanced cases the "cures," either by radiation or hysterectomy, were very few. The value of radium as a palliative in advanced cases is beyond dispute. J. Heyman (Ibid., Feb., 1925) points out that the results with radium are obtained with but a very small primary mortality—1.2 per cent. in his 505 cases (from peritonitis or sepsis).

J. L. Faure (Bull. de l'Acad. de méd., Oct. 21, 1924) reports unusually good results from operation, viz., 80 per cent. of complete recoveries in early diagnosed cases, with a mortality below 3 per cent. in all forms, and is convinced of the superiority of hysterectomy over radium.

Insertion of buried capillary glass tubes of radium emanation in cervical cancer is favored by I. Levin (Amer. Jour. of Roentgenol., Oct., 1924).

As regards deep X-ray treatment, J. G. Clark (Prog. Med., June, 1925) notes that our skilled, conservative Roentgenologists are as yet hazarding no such optimistic statements as those issued from some German clinics.

W. Wayne Babcock (Amer. Jour. of Obst. and Gyn., June, 1924) endorses zinc chloride applications ("chemical hysterectomy") in inoperable cervix cancer; to destroy quickly and permanently infected metrium and endometrium; to produce amenorrhea or absolute sterility, and to eradicate cer-

tain intrauterine tumors. Under local, nitrous oxide or narcotic anesthesia, a uterine packer is passed well through the internal os and the cervical cavity and uterus packed with narrow gauze tape impregnated with saturated zinc chloride solution, the vagina being protected with a strip of gauze bearing dry sodium bicarbonate. Then the vagina is packed with other strips of soda-impregnated gauze so that the cervix and caustic tape are surrounded. The whole is withdrawn in 72 hours or less. The uterine slough usually comes away in a week; if not expelled by the 9th day, it is removed, if loose, by forceps or the finger. Any oozing is checked by alum and vaginal packing.

UTERUS.—CANCER.—That hypoplasia of the sex organs is a factor predisposing to uterine cancer is suggested by A. Mayer (Münch. med. Woch., Nov. 28, 1924) since menstruation did not begin before the age of 17 in 48.4 per cent. of patients with cancer of the body of the uterus and in 42 per cent. with cancer of the cervix.

G. W. Crile (Amer. Jour. of Obst. and Gyn., May 1924) reports that out of 91 fundus cancer cases available for study, 70 were subjected to radical operation with a mortality of 8.6 per cent. Palliative operation was performed in 17 cases. Fourteen patients heard from were alive after 3 years, and 11 after 5 years. C. C. Norris and M. Vogt (*Ibid.*), among 115 cancers of the body of the uterus treated by operation and irradiation, obtained 3-year hysterectomy cures in 37.5 per cent. and 3-year irradiation cures in 45 per cent. The operative mortality from hysterectomy was 7 per cent. and from radium 6 per cent. Of 86 3-year cases, 34.8 per cent. were still alive to date; the

teaching that 60 to 75 per cent. of the "cures" are permanent is fallacious.

FIBROMYOMA. — According to C. Lockyer (Brit. Med. Jour., June 14, 1924), 55 per cent. of all fibroids require no treatment; 35 per cent require removal, leaving 10 per cent. to be dealt with by radium. Deep myomectomy involves somewhat more risk than supravaginal amputation, but the added risk should be ignored if there is a chance of subsequent childbirth. He records 195 total hysterectomies with a mortality of 1.54 per cent., and 284 supravaginal amputations, 1.76 per cent. One or both ovaries should be conserved, if healthy, whatever be the patient's age.

J. G. Clark (Prog. Med., June, 1925), with a wide experience in the use of radium, states that there are many cases in which this agent is not indicated, as illustrated by the fact that in his clinic about 50 per cent. of cases have been subjected to operation. He formulates the contraindications to radium thus: (1) Tumors larger than a 3 months' pregnancy (tendency to degenerative changes as well as associated adnexal or intestinal pathology requiring surgical treatment). (2) Rapidly growing tumors. (3) Uncomplicated tumors of any size causing symptoms other than abnormal menstruation (chiefly mechanical symptoms). (4) Tumors associated with pelvic pain (often due to adnexal disease, in which radium may excite an exacerbation). Pedunculated (5)tumors. (6) Tumors with hemorrhage and demonstrable adnexal pathology. (7) Marked secondary anemia disproportionate to the amount of uterine bleeding (points to widespread necrosis of the tumor). (8) Tumors in young women (since the radium in sufficient dosage will likely cause premature menopause and sterility). (9) Tumors so distorting the uterus as to preclude proper introduction of radium. (10) Where myoma and adnexal tumor cannot be definitely differentiated. (11) Myomas or myopathic hemorrhage in nervous women (many developing very marked menopausal symptoms after radium). (12) Cases of radiophobia.

According to C. F. Burnam (Amer. Jour. of Obst. and Gyn., Oct., 1924), over 50 per cent. of large uterine fibroids (the size of a 4 to a 7 months' pregnancy) can be made to disappear completely by appropriate radium radiation, practically without risk or discomfort, with little loss of time from ordinary duties, and without complicating any operative procedures that might later be required. The radium dosage has to be considerably heavier than for small fibroids.

INVERSION.—In a case of inversion resulting from traction on the placenta, reported by De Gaudino (Sem. méd., July 31, 1924), the tissues were too friable to permit of immediate replacement. After 6 weeks' rest, when operation was being undertaken, the spinal anesthesia alone brought about such relaxation of the tissues that the uterus was easily reduced.

PROLAPSE. — The transposition operation is advocated by Phaneuf (Amer. Jour. of Obst. and Gyn., Sept., 1924) when the uterus is normal in size or hypertrophied (58 cases in his series), whereas with an atrophic uterus he has had better results from vaginal panhysterectomy

with transposition of the united broad ligaments between the bladder and vagina (5 cases).

In a case of complete uterine and vaginal prolapse, with extensive vaginal ulceration and cystocele, in a woman of 80 years, diathermy was used by R. Cougoureux (Arch. d'électr. méd., Oct., 1923), with striking results. Not only did the ulceration heal rapidly, but complete spontaneous reduction of the uterus and bladder occurred 4 days after the 4th treatment. This result was permanent, apparently through betterment of local nutrition by the diathermy.

#### RETRODISPLACEMENTS.—

Experience with 1000 cases has convinced R. T. von Jaschke (Münch. med. Woch., May 23, 1924) that uncomplicated *retroflexion* of the uterus causes no characteristic symptoms aside from the findings on palpation.

H. Henneberg (Gyn. et obst., Aug., 1923) endorses the prevalent view that a painless movable backward displace-

ment does not call for treatment. pain is present, but stops as the uterus is replaced, surgical treatment should be considered; otherwise not, as the pain then arises from other conditions, e.g., anemia, chlorosis, hysteroneurasthenia, or ptosis of the stomach, liver or intestine. symptoms of retroversion being often mainly those of disturbed function, A. Donald (Brit. Med. Jour., Dec. 13, 1924) advocates treatment by curettage, as in chronic endometritis. Pessary treatment is indicated temporarily in some cases of sterility and of early pregnancy associated with retroversion.

> In incipient incarceration of the retroflexed gravid uterus, Unterberger (Zent. f. Gyn., May 5, 1923) straps the woman to the operating table and uses a very steep Trendelenburg position for 10 to 15 minutes. The procedure may be repeated if required to make certain the successful result.

## V

VALVULAR DISEASE.—The survival period following valvular disease was studied by N. Betchov (Arch. des mal. du cœur, Sept., 1923) in 115 cases. The general average of survival was 19.8 years, and in lesions primarily mitral, aortic and multivalvular was, respectively, 23.9, 19.2 and 15.1 years. In 16 per cent. of mitral cases the survival was over 40 years. In general, the earlier in life the disease began the longer the survival.

Studying the functional murmurs, Gallavardin (Lyon méd., Jan. 13, 1924) has become convinced that the systolic murmurs often present in aortic insufficiency without lesions of aortic stenosis are of the sub-aortic functional type, best heard along the left lower border of the sternum and sometimes transmitted upward to the infraclavicular regions or downward to the apex. Similarly, mitro-aortic murmurs audible over a wide area, from the left axilla to the outer end of the right clavicle, are seldom caused by a double aortic and mitral disease, but usually by aortic stenosis without mitral lesions.

MITRAL STENOSIS. — Where there is difficulty in distinguishing by auscultation aortic insufficiency from functional pulmonary regurgi-

tation complicating mitral stenosis, or from an Austin Flint type of aortic insufficiency without mitral stenosis, P. Ribierre (Paris méd., July 7, 1923) lays stress on orthodiagraphy. A small left ventricle with a large left auricle is characteristic of mitral stenosis, while pulmonary insufficiency is evidenced by dilatation of the artery. In extreme dilatation of the left auricle in mitral stenosis, Mentl (Casop. lek. cesk., Apr. 26, 1924) has often noted pain and dulness in the right paravertebral region. Fluoroscopy may show the left auricle at the right border of the heart. M. Notkin (Arch. of Int. Med., Jan., 1920), reporting a case of paralysis of the recurrent laryngeal nerve in mitral stenosis, emphasizes the importance of fluoroscopic examination, since often it alone affords a distinction from aortic aneurysm.

Treatment.—Surgical treatment in mitral stenosis has been carried out in 4 cases by E. C. Cutler, S. A. Levine and C. S. Beck (Arch. of Surg., Nov., 1924). Their cardiovalvulotome can cut a fibrosed and even a calcareous mitral orifice, and is introduced into the heart at the apex between mattress sutures already in place. The 1st patient was living and apparently improved 1 year after the operation. The other 3 died 10 hours, 20 hours and 6 days after the operation, but not from causes directly connected with it.

Digitalis is important both in dia-

gnosis and treatment.

AORTIC INSUFFICIENCY.— Three cases with necropsy observed by Laubry and Doumer (Bull. Soc. méd. des hôp. de Paris, Apr. 20, 1923) showed the possibility of a functional aortic insufficiency, probably the result of dilatation and fatigue of the muscle tissue about the aortic opening. A pulse pressure above normal, in the absence of bradycardia, suggests aortic insufficiency, according to Goyena (Sem. méd., Aug. 7, 1924). Amblard (Presse méd., May 12, 1923) states that a normal or high diastolic pressure indicates that the aortic insufficiency is almost certainly of syphilitic origin.

Treatment. — Temperature is of great importance in bath treatment in aortic insufficiency, according to Lurz (Deut. med. Woch., Mar. 28, 1924). These cases prefer relatively cool baths, viz., at 30° C. (86° F.).

VARICELLA.—As instances of larval varicella E. Wieland (Jahrb. f. Kind., Mar. 5, 1924) refers to 7 cases in an institution, in which the vesicles showed a marked predilection for the scalp, few occurring on the patients' bodies. There was slight fever, and the lesions developed and retrogressed abruptly.

Prophylaxis.—To protect 9 infants exposed to chicken-pox, A. A. Weech (Jour. Amer. Med. Assoc., Apr. 19, 1924) injected intramuscularly, 1 to 6 days after the exposure, 3 to 4.5 c.c. of convalescent serum obtained from children in whom the disease had set in 10 to 20 days before. Eight of the infants escaped the disease, while the 9th had an extremely mild attack appearing after an incubation period of 22 days. The immunity resulting from the serum injection is thought to persist about 8 weeks.

VARICOSE VEINS.—Attention to the patient's general system in varicose veins is urged by L. Mabille

(Rev. españ. de urol. y derm., Jan., 1924). Among other measures he prescribes tablets each containing thyroid gland, 0.03 Gm. (½ grain); pituitary extract, 0.01 Gm. (½ grain); extract of hamamelis, 0.04 Gm. (¾ grain), and sodium citrate, 0.25 Gm. (4 grains). Four to 6 tablets are taken daily.

Various additional suggestions have been made for the injection treatment of varicose veins. Linser (Münch. med. Woch., Apr. 18, 1924) injects into the vein either 2 c.c. (32 minims) of 30 per cent. alcohol or 5 to 10 c.c. (80 to 160 minims) of a 15 or 20 per cent. sodium chloride solution. The intima is injured by these agents and a firm thrombosis results. J. Troisier (Bull. Soc. méd. des hôp. de Paris, May 15, 1924) injects a 100 per cent. sodium citrate solution every 2 or 3 days, causing an inflammatory reaction and gradual obliteration. From 2 to 40 Gm. of the solution may be required, according to the number of varices present.

VARIOLA.—DIAGNOSIS.—In an epidemic of mild smallpox in Berne, G. Pantasis (Schweiz. med. Woch., Dec. 25, 1924) made a study of the blood picture with the object of securing diagnostic assistance from it. In practically no other infectious disease does a leukocytosis occur so early, viz., in the incubation period. More serviceable for diagnosis, however, is the leukopenia occurring in the prodromal and eruptive stages. From 6000 to 6500 on the 1st day of the prodromal stage the leukocytes dropped to 4000 or even 2000 on the 3d day. This drop is coupled with a sharp reduction of the polymorphonuclear neutrophiles, which

fall to 40 or 30 per cent. of normal—4200 to 1200—at the end of the prodromal period. Meanwhile, the lymphocytes begin to rise on the 2d day and soon exceed the polynuclears in number. Many large lymphocytes are seen, even up to 20 per cent. of the total number of leukocytes. The absolute and relative neutropenia persists in the eruptive stage. This blood picture is especially useful in the differentiation of early measles.

## VERONAL. See BARBITAL.

VERRUCA.—To remove a wart, Blendermann (Deut. med. Woch., May 18, 1923) applies tincture of iodine, freezes the wart with ethyl chloride, and curets it off. There is no pain, and scarring is inconspicuous.

According to H. C. L. Lindsay (Arch. of Derm. and Syph., Oct., 1924), intravenous injection of 0.6 Gm. of neoarsphenamin is capable of curing warts that have proven refractory to various other measures.

#### VINCENT'S ANGINA.—G. O.

Doane (Jour. Iowa State Med. Soc., Nov., 1924) states that the incubation period of this disorder, also known as trench mouth, is 6 days. The causative fusiform bacilli and spirochetes stain fairly well with methylene blue or aniline gentian violet, but best with carbolfuchsin. Ninety per cent. of the membranes or ulcers are on the tonsils, but the process may extend widely over the gums. The teeth should be cared for as required and a gargle of 50 per cent. hydrogen peroxide used every 1/2 hour. The ulcer is cleaned with peroxide and treated with a zinc iodide solution. According to T. L. Driscoll (Va. Med. Mthly., July, 1924), a specific effect

in Vincent's angina is exerted by the intravenous injection of 5 c.c. (80 minims) of a 1 per cent. solution of tartar emetic.

## VOMITING.—IN CHILDREN.

The preventive treatment of cyclic vomiting by giving alkali is endorsed by G. Fismer (So. Afr. Med. Rec., Dec. 22, 1923). Its efficacy was clearcut in a severe case in which 10 grains (0.6 Gm.) each of sodium bicarbonate and potassium bicarbonate 3 times daily were prescribed for 1 week in every month. DeW. H. Sherman and E. C. Koenig (Arch. of Ped., Sept., 1924) call attention to gastroenteroptosis in neuropathic children as a cause of recurrent

vomiting with symptoms of ketosis and dehydration. Thirty such cases were strikingly relieved by wearing an abdominal supporting belt applied with the hips elevated above the shoulders to an angle of about 45°. The belt is held down by garters to a level immediately above the symphysis pubis.

An atonic stomach, leading to vomiting, anorexia, or both, is not infrequent during the early weeks of life, according to G. Lindberg (Amer. Jour. Dis. of Childr., Mar., 1924). This condition can sometimes be corrected by keeping the baby in a half-erect position and slowly rocking him back and forth for some time after each meal.

## W

WATER.—HYDROTHERAPY.— In a study of the physiologic effects of the temperature of baths, H. C. Bazett (Amer. Jour. of Physiol., Oct., 1924) found that if the water was hot the pulse-rate went up, generally in proportion to the rise of body temperature produced. A bath feeling definitely warm when entered usually produced some skin hyperemia and a fall of both systolic and diastolic pressures of from 0 to 10 mm. Hg. Diuresis is observed in all baths, cold as well as neutral or warm; with it the hydrogen ion concentration tends to approach neutrality, but if the body temperature rises the blood may become very alkaline.

The best substitute for cold tub baths, according to J. M. Anders (Jour. Amer. Med. Assoc., July 26, 1924) is the cold pack, which should be used in the severer types of typhoid and other fevers. It may be repeated at 4-hour intervals if necessary, and should be followed by gentle friction. In influenza a sponge bath with friction every 3 hours acts as a true vasomotor stimulant. The temperature should be lowered by 3° F. each time from 90° down to 75°.

Water, 4 ounces, should also be drunk every 3 hours. In obesity, cold baths (70° F.), followed by vigorous friction, yield the best results. In chronic nephritis the warm tub daily or the electric cabinet bath on alternate days should be employed.

# WHOOPING COUGH. See Pertussis.

WOUNDS.—In injuries met with in a miner's hospital, A. Eisenbach (Beitr. z. klin. Chir., cxxxi, 656, 1924) first injects tetanus antitoxin, cleanses the skin and disinfects it with iodine, and thoroughly washes the wound with hydrogen peroxide. He next endeavors to excise the wound through healthy tissue, and if the wound can thus be made relatively free of bacteria, he then swabs all recesses with 5 per cent. iodine in alcohol and, if undue tension does not prevent it, closes the wound by

immediate suture. For this purpose, thorough hemostasis and close contact of healthy wound surfaces, without any underlying blood clots, are necessary.

For hemostasis in operative wounds, R. Vogel (Klin. Woch., July 15, 1924) employs citrated blood plasma. He mixes 100 c.c. of blood from man or cattle with 8.5 c.c. of 2 per cent. sodium citrate solution and centrifugates it. Coagulation of the plasma occurs in 2 minutes at 38° C. upon addition of 5 per cent. by volume of 4.5 per cent. calcium chloride solution.

To secure extensive epidermization of a healthy granulating wound without skin grafting, R. F. and G. R. R. Hertzberg (Amer. Jour. of Surg., Sept., 1924) wash the surface with gasoline, dry it thoroughly but gently with cotton or gauze pledgets, paint the wound edges, including 1/2 inch of the granulation tissue, with a mixture in equal parts of balsam of Peru and castor oil, and strap them with sterilized adhesive strips 1 inch wide, lying directly on the streak of balsam so as to encircle the open area. Firm pressure on the skin edges, without puckering, is important. The center of the wound is dressed with 1 or 2 per cent. dichloramin-T in chlorcosane. This procedure is repeated daily, the adhesive being removed by gentle upward and inward pulling. In 10 days epithelial continuity is restored, and a surprising cosmetic result follows. According to Mercadé (Bull. de l'Acad. de méd., Mar. 13, 1923), epithelialization begins on the 2d day under a mixture of peptone and manganese.

In infected wounds that are healing too slowly, Goljanitzki (Zent. f. Chir., July 19, 1924) injects, in the course of a day or 2, into the tissues surrounding and beneath the wound, 5 to 25 c.c. of a 20 per cent. own blood solution, to which 0.25 per cent. of procaine and an isotonic amount of sodium chloride has been added. To control pyocyaneus infection, Paetzel (Deut. med. Woch., June 22, 1923) finds powdered boric acid effective. According to F. Sauerbruch (Münch. med. Woch., Sept. 19, 1924), an acidpromoting diet of proteins and fats, together with phosphoric acid, reduces wound secretion and dispels the proteus and pyocyaneus bacilli.

In severe injuries (impalements, stab wounds, etc.) that show a tendency to develop sepsis, E. Birt (Zent. f. Chir., Jan. 12, 1924) obtains good effects from neoarsphenamin, injected in a dose of 0.2 Gm., and occasionally repeated with 0.3 or 0.4 Gm. In 11 cases reported, this measure curbed febrile attacks and enhanced antibacterial defence in the wounds.

## X

X-RAYS. —Many have shown, according to P. del Buono (Amer. Jour. of Roentgenol., Sept., 1923), that the blood-vessels are the structures most sensitive to the X-rays. When they are in any way diseased, necrosis in radiated tissue may result. The vascular endothelium recovers last. The cumulative action of the X-ray may be ex-

plained by the fact that even small doses cause a change in the endothelium. Hyperemic skin is more resistant to the X-ray, while inflammation increases its radiosensitivity.

In the *blood*, D. den Hoed (Ned. Tijd. v. Gen., Oct. 4, 1924) noted a high leukocytosis following X-ray exposure; after this

the leukocytes dropped to far below normal. Mouquin (Paris méd., Sept. 20, 1924) observed after deep radiotherapy a leukopenia, which may persist for several months, with a relative polymorphonuclear leukocytosis and lymphopenia. Further X-ray exposure should be avoided as long as pronounced anemia or leukopenia continue.

According to Guilbert (Jour. de radiol. et d'électr., Oct., 1924), the X-ray gradually paralyzes liver catalase. The *peroxidases* are activated by small but paralyzed by large doses. The ray acts as a catalyzer for the oxidation of adrenalin.

Reduction of blood-pressure is produced by the X-ray, according to 400 tests in 80 patients by C. Schroeder (Zent. f. Gyn., Aug. 16, 1924). The decrease nearly always began immediately after the exposure, and persisted for many days or even weeks. It was especially pronounced in subjects with high blood-pressure.

S. Russ (Brit. Jour. of Radiol., Aug., 1924) concludes, with others, that the X-ray and radium influence the normal tissues, e.g., in tumor cases. If the doses are small the body-weight increases and there is increased resistance to tumor growth. He suggests weak general X-ray exposures in addition to the local stronger radiation of the tumor. In weakly children Bucky and Kretschmer (Klin. Woch., Aug. 6, 1923) have used a 1/4 erythema dose of the X-ray successfully to increase weight. The exposure was not renewed until after 2 months, and then only if the effect of the original exposure had passed off. The treatment was applied over the chest in tuberculous children.

In dermatitis from **frost bite**, Borak Med. Klin., Feb. 1, 1925) found the erosions, chilblains and especially pain very favorably affected by X-ray treatment.

Having observed a marked decrease of suppuration upon taking an X-ray picture in a case of osteomyelitis of the pelvis, L. Heidenhain and C. Fried (Arch. f. klin. Chir., Nov. 24, 1924) tried the X-ray therapeutically in various inflammatory conditions. Among the cases reacting well were those of acute lymphadenitis, furuncle, non-gonorrheal epididymitis, postoperative

pneumonia, empyema, perinephric abscess (after operation), endometritis and exudative parametritis. The dosage must be small, viz., from 10 to 25 per cent. of the skin erythema dose.

UNTOWARD EFFECTS.—With reference to X-ray sickness, A. T. Cameron and J. C. McMillan (Lancet, Aug. 23, 1924) lay stress on a definite lowering of urine excretion and chloride retention when the upper abdomen is irradiated. If previous chloride excretion has been low the tendency to sickness is greater. Preliminary feeding of sodium chloride, so that chloride excretion is raised to 10 or more grams per day, with continued use during treatment, prevents or lessens the sickness.

Lignac and Devois (Presse méd., Apr. 2, 1924) deem adrenalin a rational preventive and curative agent for X-ray disease. Direct exposure of the adrenals should be avoided, and when the chest or abdomen are to be exposed food should be withheld before the treatment.

Experiments by C. L. Martin and F. T. Rogers (Amer. Jour. of Roentgenol., Mar., 1924) showed, among other results, that fat absorption was inhibited when heavy doses of the rays reached the small intestine. The intestinal mucus may be greatly increased.

In radiodermatitis, Desjardins and F. L. Smith (N. O. Med. and Surg. Jour., Nov., 1924) find hychlorite dressings useful in cleansing the wound. Sunlight in conjunction with wet dressings is excellent. Paraffin dressings, changed daily, are serviceable in ambulant treatment. When a whitish exudate appears, hychlorite dressings are indicated. In the chronic radiodermatitis of radiologists, early radical measures are safest in the long run.

Läwen's intracutaneous injection of the patient's own blood about severe X-ray ulcers is endorsed by G. Tillmann (Münch. med. Woch., Apr. 18, 1924). Very good results are obtained upon injecting in a complete ring about 1 inch from the ulcer margins.

Subsidence of pain and vigorous granulation was noted in 2 cases of long-standing X-ray ulcer by Gundermann (Beitr. z. klin. Chir., cxxix, 231, 1923) following periarterial sympathectomy.

## Y

YAWS (FRAMBESIA).—A case of this disease in a colored man of 27 years has been reported from Missouri by L. D. Cady and M. F. Engmann (Arch. of Derm. and Syph., Oct., 1924). Recovery took place promptly under 4 injections of neoarsphenamin.

In dealing with this disease in Samoa, D. Hunt and A. L. Johnson (U. S. Nav. Med. Bull., May, 1923) found that at least 3 injections of neoarsphenamin, over a period not exceeding 3 weeks, give the best results, 1 injection not sufficing for a cure. Never less than 0.3 Gm. is given intramuscularly to children when a vein cannot be conveniently used, and 0.9 Gm. intravenously is the initial dose for the average adult. Potassium iodide, when indicated, is of great value. Mercury has been thought helpful in some cases. All lesions should be dressed like other similar skin conditions.

As a far cheaper but equivalent substitute for neoarsphenamin where large indigenous populations are to be dealt with, A. R. Paterson (Proc. Intern. Conf. on Health Probl. in Trop. Amer., 1924) recommends sodium and potassium bismuthotartrate, which has been used with success in over 36,000 cases in the Colony of Kenya, Africa. The dose for an ordinary adult is 3 grains (0.2 Gm.) given intramuscularly in the buttocks in 2 c.c. (48 minims) of distilled water. A smaller dose is used in infants and old people. Some pain results, but this is not notably greater than after an arsenical. The 3-grain dose should never be exceeded. A. Castellani (*Ibid.*), in cases in which for some reason injections cannot be given, recommended the following mixture:

Addition of 1 dram (4 c.c.) of glycerin and a like amount of syrup will keep this mixture clear of a precipitate. The salicylate seems to hasten disappearance of the thick crusts, while the bicarbonate tends to prevent iodism and decrease the emetic properties of the mixture.

YELLOW FEVER.—A small outbreak of yellow fever in Belize proved, according to J. Cran (Jour. of Trop. Med. and Hyg., Jan. 15, 1925), the value of the Noguchi anti-icteroides serum as a curative agent and that of the Noguchi vaccine as a prophylactic.

The outbreak he describes started in a large secondary college 1 mile from the outskirts of the town. Of the 17 cases occurring in the college, 4 were already in their 4th to their 6th day of the disease when they received the serum; all these died. All of the other 13, who received the serum on the 1st or 2d day, recovered. In the town itself, the only 2 whites who contracted the disease had not been vaccinated, while 100 or 200 who had been vaccinated escaped, although equally susceptible and equally exposed.

Z

ZINC.—Further attention has been directed of late to the possible injurious effects of zinc stearate inhalation in infants. As noted by E. S. O'Keefe (Boston Med. and Surg. Jour., Oct. 16, 1924), zinc stearate is a compound of zinc acetate and castile soap. The inhalation is apt to occur in infants between 8 months and 1 year of age, who, lying on their back, hold up the powder box for inspection and inhale some of the shower of powder falling from its orifice. Where the quantity inhaled is sufficient, there results in a few hours a condition simulating laryngeal diphtheria or bronchopneumonia, the latter

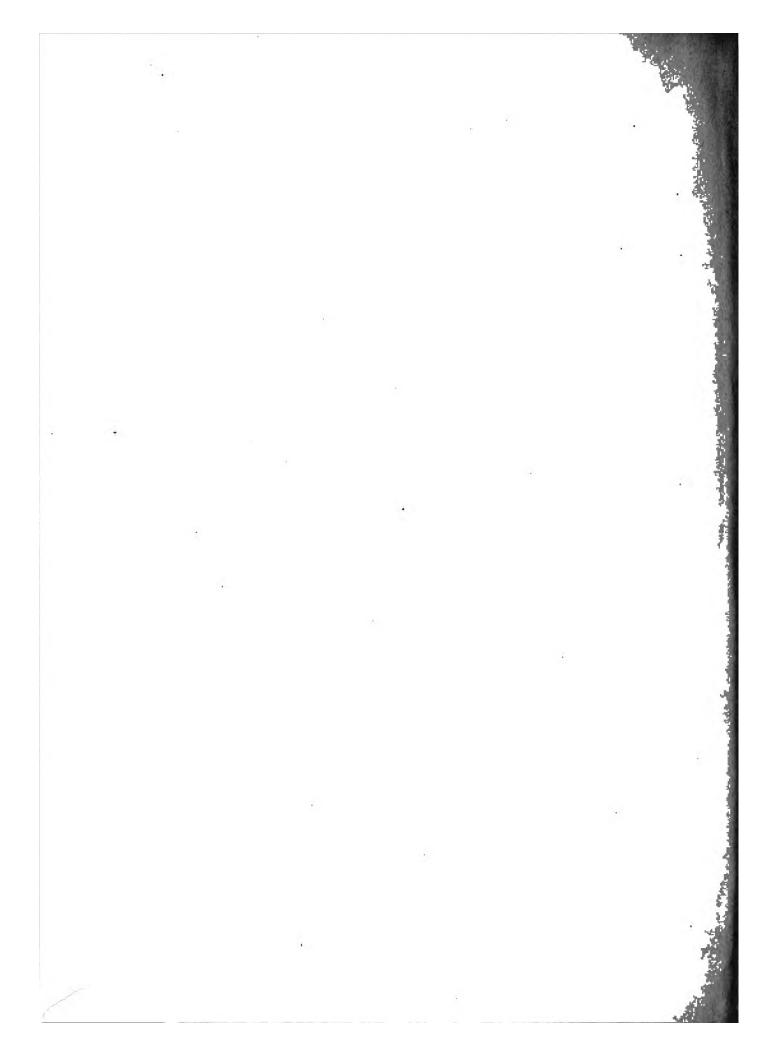
with fever and high pulse continuing for several days. Fatal cases have been reported, but none of the author's 6 cases failed to show improvement in 72 hours. When the child is 1st seen efforts should be made to remove from the mouth and nose as much of the powder as possible. Gastric lavage and thorough catharsis should follow. Thereafter symptomatic measures should be availed of. Expectorants may be serviceable in diluting the zinc that may have entered the bronchi. For dyspnea and pronounced obstruction the croup tent may be brought into requisition.

1		
	, *	
	k.	
		- 7
	(1)	
•		

			44
		(a)	
			1
			•
2)			
	*		

		1
		4-
		4





	,		in milks and the	and it is the safe			
					To the state of th		
					75.0		
100		ş -					
							*
						3	
			*				
	*		ů.				
					in (a		
			4-				

